STEVEN J. ROSENSTONE
Chancellor

30 7TH ST. E., SUITE 350
ST. PAUL, MN 55101-7804

ph 651.201.1696
fx 651.297.7465

Minnesota
STATE COLLEGES
& UNIVERSITIES

www.mnscu.edu

Minnesota State Colleges and Universities are pleased to introduce the second systemwide conference highlighting the undergraduate research taking place at our universities and colleges.

We are proud to be able to provide an opportunity for undergraduate students from seven MnSCU universities – Metropolitan State University; Minnesota State University, Mankato; Minnesota State University Moorhead; St. Cloud State University; Southwest Minnesota State University; Bemidji State University; and Winona State University – and four colleges – Rochester Community and Technical College, North Hennepin Community College, Inver Hills Community College, and Minneapolis Community and Technical College – to present their research and scholarly and creative projects. This year's conference has experienced an impressive 100% increase in student presentations, reflecting the passion and commitment of faculty, students, staff, and administration.

We are also proud of the intercampus collaboration and engagement that has emerged during the planning of this conference. This has been a great opportunity for faculty, staff and students to work together and learn from each other. Collectively, everyone involved has helped elevate MnSCU's reputation as a leader in undergraduate research. That reputation depends heavily on time, energy and resources that students, faculty and staff invested into the poster and oral presentations that are part of this conference.
I commend our students' creativity and commitment to solve real world problems. I am confident that this experience will prove useful throughout our students' lives.

Thank you for participating in the 2013 MnSCU Conference of Undergraduate Scholarly and Creative Activity.

Steven Rosenstone

STATE UNIVERSITIES
Bemidji State University*
Metropolitan State University
Minnesota State University, Mankato
Minnesota State University Moorhead
St. Cloud State University
Southwest Minnesota State University
Winona State University

STATE COLLEGES
Alexandria Technical & Community College
Anoka-Ramsey Community College**
Anoka Technical College**
Central Lakes College
Century College
Dakota County Technical College
Fond du Lac Tribal & Community College
Hennepin Technical College
Inver Hills Community College
Lake Superior College
Minneapolis Community & Technical College
Minnesota State College-Southeast Technical
Minnesota State Community & Technical College
Minnesota West Community & Technical College
Normandale Community College
North Hennepin Community College
Northeast Higher Education District
- Hibbing Community College
- Itasca Community College
- Mesabi Range Community & Technical College
- Rainy River Community College
- Vermilion Community College

Northland Community & Technical College
Northwest Technical College*
Pine Technical College
Ridgewater College
Riverland Community College
Rochester Community & Technical College
St. Cloud Technical & Community College
Saint Paul College
South Central College

* Aligned
** Aligned

MINNESOTA STATE COLLEGES AND UNIVERSITIES
UNDERGRADUATE RESEARCH CONFERENCE OF SCHOLARLY AND CREATIVE ACTIVITY

LETTER FROM THE PRESIDENT

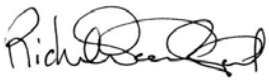
Welcome to the second annual MnSCU Undergraduate Research Conference of Scholarly and Creative Activity. It is a great honor for Minnesota State University, Mankato to host this conference. We have a long history of recognizing the research of our own undergraduate students, and we are pleased to be able to showcase the research and creative activity of students from throughout the Minnesota State Colleges and Universities system.

The accomplishments embodied in the projects at this year's conference came about through the collaboration of talented, motivated students and dedicated faculty mentors. It takes a tremendous amount of time, energy and passion to complete such projects, and I applaud all those who took part in the process, including students, faculty and staff from every involved institution.

Participating in undergraduate research, and working one-on-one with a faculty mentor in the process, can be a life-changing opportunity for many students. Not only does it enrich a student's collegiate experience, it also has a wide-reaching impact that can lead to the pursuit of advanced degrees, open doors to career opportunities and encourage a lifelong love of learning.

Minnesota State University, Mankato is proud to celebrate the achievements of everyone involved in the 2013 MnSCU Undergraduate Research Conference of Scholarly and Creative Activity.

Enjoy your time in Mankato!



Richard Davenport
President
Minnesota State University, Mankato

Luncheon Keynote Speaker

Dr. Schultz is an Associate Professor in Human Resource Management (HRM) for the College of Management at Metropolitan State University in Minneapolis, Minnesota. She serves as the Curriculum Coordinator for the undergraduate HRM program and teaches graduate and undergraduate courses in management, HRM, and business administration. She earned a B.S. in Philosophy from the University of Wisconsin-LaCrosse, an M.Ed. in Higher Education from the University of Georgia, an M.B.A. in Management from Our Lady of the Lake University (San Antonio, TX) and a Ph.D. in Human Resource Development from the University of Minnesota-Twin Cities. She has over 20 years of experience in collegiate teaching, higher education administration, and business. She has held leadership positions in human resources, sales, marketing, and executive management; including strategic corporate leadership and profit/loss responsibilities.

She has an active research and writing agenda focused on formal workplace social networks, classroom research on student attitudes and perceptions of pedagogy, and the application of barrier-free teaching practices across the curriculum. She has presented original research at the International College Teaching and Learning Conference, International Applied Business Conference, The Academy of Human Resource Development International Research Conferences in the Americas, the Midwest Academy of Management Annual Meetings, and the International Academy of Business Disciplines Annual Meeting. Her research has been published in the *Business Research Yearbook*, *American Journal of Business Education*, *Journal of Business and Education Research*, *Journal of Diversity Management*, *Journal of College Reading and Learning*, *Contemporary Issues in Education Research*, and *Research & Teaching in Developmental Education*. She was the recipient of the 2011 Metropolitan State University Antiracism and Diversity Leadership Award. She is the Program Chair-elect for the Midwest Academy of Management.

A Message from the MSUM Undergraduate Research Center

It is with great pleasure we welcome administrators, students, faculty, and staff to the Minnesota Conference of Undergraduate Scholarly and Creative Activity. We are excited to showcase the excellent undergraduate research that is happening at Minnesota State Colleges and Universities including Minnesota State University-Mankato, Minnesota State University-Moorhead, Winona State University, Southwest Minnesota State University, St. Cloud State University, Bemidji State University and Metropolitan State University. We are delighted to welcome Rochester Community and Technical College, North Hennepin Community College, Inver Hills Community College, Minneapolis Community and Technical College, and Anoka-Ramsey Community College.

The purpose of this conference is to provide undergraduate students the opportunity to present their research, scholarly and creative projects through poster and oral presentations, visual displays, and performance art. This Conference provides intercampus engagement for faculty and students, building pipelines between campuses and highlights the remarkable undergraduate research that takes place on our campuses.

The conference has been planned for over a year, with the combined efforts of the Campus Coordinators. The vision, commitment and contributions of the Coordinators have made this event possible. In addition, the Minnesota State University-Mankato Undergraduate Research Council has played an essential role in the success of this event, especially the members of the Conference planning subcommittee.

As you attend the conference, you will see the many forms of undergraduate research that occurs on Minnesota State University and College campuses and gain an understanding of the tremendous impact that involvement in undergraduate research has in the lives of the students.

With Kindest Regards,

Marilyn Hart, Director
Undergraduate Research Center
Minnesota State University-Mankato

MN Conference of Undergraduate Scholarly and Creative Activity Campus Coordinators

Minnesota State University- Mankato
Marilyn Hart- Director Undergraduate Research Center

Minnesota State University- Moorhead
Richard Lahti- Chemistry

Winona State University
Mike Delong- Director Large Rivers Studies Center

Southwest Minnesota State University
Emily Deaver- Environmental Science

St. Cloud State University
Linda Donnay- Office of Sponsored Programs

Bemidji State University
Troy Gilbertson- Professor, Criminal Justice

Metropolitan State University
Jennifer Schultz- Asst Prof and Curriculum Coordinator for Human Resource Management

2011-2012 MSUM Undergraduate Research Council Members

Marilyn Hart, Director- Undergraduate Research Center *
Alexandra Panahon - MSUM Undergraduate Research Symposium Coordinator *
Barry Ries- Interim Dean of Graduate Studies and Research
Barbara Bergman *
Emily Boyd
Christopher Corley
Joseph Holtermann
Mary Susan Johnston
Karla Lassonde
Ihsuan Li *
Steven Losh
Mark McCullough
Cindra Kamphoff
Laura Riness
Elizabeth Sandell
Kristin Scott
Mary Visser
Heather Von Bank
Trenton Vorlicek
Gina Wenger *
Forrest Wilkerson
Hongxia Yin *
Supriya Sarkar*
*__Denotes members of the MSUM Conference Planning Subcommittee__

Sunday, April 7	Schedule of Events	
6:00 – 8:00 pm	**Check-in, Registration**	CSU Game room
6:00 – 8:00 pm	**Evening Social and Pizza**	CSU Game room
7:00 – 9:00 pm	**Bowling and Billiards**	CSU Game room

Monday, April 8	Schedule of Events	
7:30 am – 3:00 pm	**Check-in, Registration**	CSU Ballroom Lobby
8:00 – 9:30 am	**Continental Breakfast, provided**	CSU Central Ballroom
8:15 – 8:30 am	**Opening Remarks** Richard Straka, VP Finance and Administration, MSU Mankato	CSU Central Ballroom
8:30 – 11:30 am	**Graduate Fair**	CSU Southeast Ballroom
8:30 – 10:30 am	**Poster Session 1** Communication Sciences, Elementary Education, Family Consumer Science, History, Information Systems, Management, Marketing, Nursing, Political Science, Psychology, Social Work, Sociology, Urban and Regional Studies, Women Studies, World Languages, Art, Health/Exercise/Rehabilitation	CSU 253/4/5
9:00 – 10:00 am	**Oral Session 1A** Economics	CSU 201
9:00 – 10:00 am	**Oral Session 1B** History	CSU 202
9:00 – 10:00 am	**Oral Session 1C** Biology, Chemistry	CSU 203
9:00 – 10:00 am	**Oral Session 1D** Automotive Engineering, Electrical Engineering, Mathematics and Computer Science	CSU 204
9:00 – 10:00 am	**Oral Session 1E** English	CSU 238
9:00 – 10:00 am	**Oral Session 1F** Philosophy, Political Science	CSU 284A

9:00 – 10:00 am	**Oral Session 1G** Geology, Automotive Engineering	CSU 285
10:15 – 11:15 am	**Oral Session 2A** English	CSU 201
10:15 – 11:30 am	**Oral Session 2B** Language and Ethnic Studies, International Studies, American Culture, World Languages and Culture	CSU 202
10:15 – 11:15 am	**Oral Session 2C** Biology, Chemistry, Mathematics	CSU 203
10:15 – 11:30 am	**Oral Session 2D** Art & Design, Art, Theatre Arts	CSU 204
10:15 – 11:15 am	**Oral Session 2E** Gender and Women's Studies, Anthropology	CSU 238
10:15 – 11:15 am	**Oral Session 2F** Political Science, Criminal Justice	CSU 258
10:15 – 11:15 am	**Oral Session 2G** Philosophy, Political Science	CSU 285
11:15 – 11:30 am	**Break**	
11:30 – 12:40 pm	**Celebration Lunch, provided**	CSU Central Ballroom
	Luncheon Keynote Speaker Dr. Jennifer Schultz, Metropolitan State University "Undergraduate Research: Transferability of Scholarly and Creative Skills for Employment"	
12:50 – 3:00 pm	**Graduate Fair**	CSU Southeast Ballroom
12:50 – 3:00 pm	**Undergraduate Discussion**	CSU Ballroom Lounge
12:50 –2:50 pm	**Poster Session 2** Biological Science, Chemistry, Environmental Science, Geoscience, Geography, Integrated Engineering, Manufacturing Engineering, Physics, Physics and Astronomy, Biotechnology	CSU 253/4/5
12:50 – 1:50 pm	**Oral Session 3A** Economics, Government	CSU 201

12:50 – 1:50 pm	**Oral Session 3B** Gender and Women's Studies, Residential Life, Community Health	CSU 202
12:50 – 1:50 pm	**Oral Session 3C** History	CSU 203
12:50 – 1:50 pm	**Oral Session 3D** Education, Management	CSU 204
12:50 – 1:50 pm	**Oral Session 3E** English, Communication, Writing and Arts	CSU 238
12:50 – 1:50 pm	**Oral Session 3F** Physics and Astronomy, Physics, Environmental Science	CSU 284A
12:50 – 1:50 pm	**Oral Session 3G** Education, Communication, Writing, and the Arts	CSU 285
2:00 – 3:00 pm	**Oral Session 4A** Elementary Education, English	CSU 201
2:00 – 3:00 pm	**Oral Session 4B** Social Work, Sociology, Ethnic Studies, Student Development	CSU 202
2:00 – 3:00 pm	**Oral Session 4C** Communication Studies	CSU 203
2:00 – 3:15 pm	**Oral Session 4D** Film, Art Design	CSU 204
2:00 – 3:15 pm	**Oral Session 4E** Creative Writing, Communication, Writing and Arts	CSU 238
2:00 – 3:15 pm	**Oral Session 4F** Biology, Chemistry and Geology, Mathematics and Statistics	CSU 284A
2:00 – 3:00 pm	**Oral Session 4G** Psychology, Counseling and Student Affairs	CSU 285

Communication Sciences, Elementary Education, Family Consumer Science, History, Information Systems, Management, Marketing, Nursing, Political Science, Psychology, Social Work, Sociology, Urban and Regional Studies, Women Studies, World Languages, Art, Health/Exercise/Rehabilitation

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1. **Alternative Approaches to Problems in Contemporary Parent - Child Relationships: Russian Context**
   Anastasiya Gerasimova
   Elizabeth Sandell, Faculty Mentor (Department of Elementary and Early Childhood Education)
   MSU Mankato

2. **Teaching Easy Onsets Effectively for Optimum Transfer Outside of the Clinical Setting**
   Jessica Nemitz, Perrin Thomas and Megan Brantley
   Sarah Smits-Bandstra, Faculty Mentor (Department of Communication Sciences and Disorders)
   St Cloud State University

3. **Poster on the Poster**
   Sheri Stiles and Lindsey Angove
   Jennifer Schultz, Faculty Mentor (Department of Management)
   Kristi Frykman, Faculty Mentor (Department of Communication, Writing, and the Arts)
   Metropolitan State University

4. **Teaching Pausing for Optimum Transfer Outside of the Clinical Setting**
   Brittany Stolt, Elizabeth Dahl and Karlee Korman
   Sarah Smits-Bandstra, Faculty Mentor (Department of Communication Sciences and Disorders)
   St Cloud State University

5. **Innovations in Pre-School Education in Russia's Far East Region**
   Ekaterina Lepekha
   Elizabeth Sandell, Faculty Mentor (Department of Elementary and Early Childhood Education)
   MSU Mankato

6. **Plague of the Black Dog**
   Ann Kopitzke
   Tom Williford, Faculty Mentor (History Program)
   Southwest MSU

7. **The Community's Awareness of the Children's Museum of Southern Minnesota**
   Marcie Woitas and Amanda Hunstad
   Heather Von Bank, Faculty Mentor (Department of Family Consumer Science)
   MSU Mankato

8. **"The Empty Pages of History"; Everyday Life of Jewish Children in the Holocaust**
   Julia Viviana Santiago
   Tom Williford, Faculty Mentor (History Program)
   Southwest MSU

9. **Analysis of IT Project Failures from a Multi-Cultural Perspective**
   Zainab Hamza
   Susan Schilling, Faculty Mentor (Department of Information Systems)
   MSU Mankato

10. **A New Information System to Track Graduation Time Lines**
    Bruce Merrell, Alex Holm, James Martin and Tyrone Sellner
    Mark Schmidt, Faculty Mentor (Department of Information Systems)
    St Cloud State University

11. **Is the American Dream Dead Among College Students?**
    Kathryn Olson
    Kristin Scott, Faculty Mentor (Department of Marketing)
    MSU Mankato

12. **Achieving Sustainability for a Health Outreach Traveling Service**
    Georgia Stumpf and Megan Isackson
    Amy Reitmaier and Carrie Spier, Faculty Mentors (Department of Nursing)
    Winona State University

13. **Cultural Competency Increases the Effectiveness of Health Education in Guatemala, Particularly When Addressing Malnutrition**
    Amie Bartlett
    Jane Bergland, Faculty Mentor (Department of Nursing)
    MSU Moorhead

14. **Stearns County Public Health Breastfeeding Resources**
    Jenita Teachout and Heather Martell
    Melinda Hiemenz and Jo DeBruycker, Faculty Mentors (Department of Nursing)
    St Cloud State University

15. **Parental Satisfaction with Involvement at Child Care Center**
    Amanda Hunstad and Marcie Woitas
    Heather Von Bank, Faculty Mentor (Department of Family Consumer Science)
    MSU Mankato

16. **Community Assessment of Diabetic Foot Ulcers in Concepción, Chile**
    Diana Gehrman, Katherine Piehl and Johanna Mahoney
    Melinda Hiemenz and Vonna Henry, Faculty Mentors (Department of Nursing)
    St Cloud State University

17. **Breaking the Silence: Perceptions of HIV/AIDS Among African Americans in the United States**
    Thomas Vincent
    Jacquelin Vieceli, Faculty Mentor (Department of Political Science)
    MSU Mankato

18. **Class Standing – Does it Effect Civic Engagement?**
    Laura Lake
    Kara Lindaman, Faculty Mentor (Department of Political Science and Public Administration)
    Winona State University

19. **Laptops in Classrooms: Evaluating Potential Benefits of Technology Against Distractions Part 3**
    Maria Almoite and Felicia VandeNest
    Karla Lassonde, Faculty Mentor (Department of Psychology)
    MSU Mankato

20. **Discrimination of Emotion in Music: An Eye-Tracking Study**
    Megan Boeddeker and Bria Itzen
    Elizabeth Nawrot, Faculty Mentor (Department of Psychology)
    MSU Moorhead

21. **Doing Research on Research: Assessing Factors That May Influence Student Research Participation in Psychology**
    Stacy Anderson
    Karla Lassonde, Faculty Mentor (Department of Psychology)
    MSU Mankato

22. **The Influence of Academic Motivation, Academic Ability, and Self-Esteem on Academic Performance**
    Tracy Kellen, Kayli Timm and Kaeley Rolland
    J. Corey Butler, Faculty Mentor (Department of Psychology)
    Southwest MSU

23. **Examining The Use of Extended Time Accommodations at a University Setting**
    MaryBeth Armstrong and Daniel Spencer
    Carlos Panahon, Faculty Mentor (Department of Psychology)
    Melissa Stewart and Marcia Sytsma, Graduate Student Mentors (Department of Psychology)
    MSU Mankato

24. **Surveying Teachers About The Use of Stability Balls As An Intervention**
    Nicole Kafka and RaeLynn Limberg
    Carlos Panahon, Faculty Mentor (Department of Psychology)
    Natasha Olson, Graduate Student Mentor (Department of Psychology)
    MSU Mankato

25. **Stereotypical Series: Portrayal of GLBT Characters in the Media**
    Lauren Teal
    Kerry Livingston, Faculty Mentor (Department of Sociology)
    Southwest MSU

26. **Examining the Role of Intuition in Deception Detection**
    Chelsea Schmillen and Colette Baudoin
    Emily Stark, Faculty Mentor (Department of Psychology)
    MSU Mankato

27. **Shelter Life**
    Jamie Linnemon
    Ruth Charles, Faculty Mentor (Department of Social Work)
    Winona State University

28. **Investigating Teachers' Perceptions of Students With EBDs**
    Cassandra Schreiber and Ashley Kuemper
    Carlos Panahon, Faculty Mentor (Department of Psychology)
    Dana Shea, Graduate Student Mentor (Department of Psychology)
    MSU Mankato

29. **LGBT Suicide Rates Among Teens in the United States**
    Katherine Bullock
    Shannon Terry, Faculty Mentor (Department of Sociology)
    MSU Moorhead

30. **Impacts of Toxic Wastes On Somali People Who Live Along The Coast**
    Ahmed Shiiraar
    Raymond Asomani, Faculty Mentor (Department of Urban and Regional Studies)
    MSU Mankato

31. **Invisible Women and the Flood of 2009**
    Kathryn Kottenbrock
    Claudia Murphy, Faculty Mentor (Department of Women's Studies)
    MSU Moorhead

32. **Feminist Perspectives on the Flooding Red River of the North: Students and Flood of 2009**
    Tiffany Zilka
    Claudia Murphy, Faculty Mentor (Department of Women's Studies)
    MSU Moorhead

33. **Ecuador's Indigenous Groups and Emigration**
    Myra Colakovic
    Elizabeth Harsma, Faculty Mentor (Department of World Languages and Cultures)
    MSU Mankato

34. **“Girl”**
    Jayme Wiertzema
    Ryan Muldowney, Faculty Mentor (Department of Art)
    Southwest MSU

35. **Ecosystem Tower Puzzle Game Demonstrates Sustainable Food Systems Model**
    Aaron Murray and Thomas Gorycki
    Janet Macon, Faculty Mentor (Department of Health, Exercise and Rehabilitative Sciences)
    Winona State University

1. **Alternative Approaches to Problems in Contemporary Parent - Child Relationships: Russian Context**
   Anastasiya Gerasimova
   Elizabeth Sandell, Faculty Mentor (Department of Elementary and Early Childhood Education)
   MSU Mankato

This research describes the problems of contemporary Russian families directly related to the nature of parent-child relationships. The study reviews the definition of "parent-child relationship" in thepsychological and educational literature, as well as methodological approaches used to explore parent – child relationships. Consideration is given to activities and ways of working with families that can strengthen parent – child relationships.

2. **Teaching Easy Onsets Effectively for Optimum Transfer Outside of the Clinical Setting**
   Jessica Nemitz, Perrin Thomas and Megan Brantley
   Sarah Smits-Bandstra, Faculty Mentor (Department of Communication Sciences and Disorders)
   St Cloud State University

Childhood stuttering affects up to 5% of children and can be associated with negative long-term consequences such as school dropout, social isolation, and unemployment (Guitar, 2010). While stuttering treatment is effective (Guitar, 2010), the cost and time involvement is prohibitive, particularly for those of low socioeconomic status (e.g., new immigrants, rural and inner city families). Speech-Language Pathologists teach new speech skills to clients who stutter. Two key principles that influence how well a client who stutters can use new skills out in the real world are practice and feedback. This project examined which types of practice and feedback optimized learning and transfer (using new skills outside of the clinical setting) of a stuttering therapy technique called easy onsets. This project is unique because no previous research has focused on comparing the effectiveness of different speech therapy techniques to save time and costs.

3. **Poster on the Poster**
   Sheri Stiles and Lindsey Angove
   Jennifer Schultz, Faculty Mentor (Department of Management)
   Kristi Frykman, Faculty Mentor (Department of Communication, Writing, and the Arts)
   Metropolitan State University

Research posters are a great way to effectively disseminate information in a visual, concise, and interesting way. This poster session shows why and how to present information via a poster, including best practices, poster examples, and additional resources for successful poster design.

4. **Teaching Pausing for Optimum Transfer Outside of the Clinical Setting**
   Brittany Stolt, Elizabeth Dahl and Karlee Korman
   Sarah Smits-Bandstra, Faculty Mentor (Department of Communication Sciences and Disorders)
   St Cloud State University

Childhood stuttering affects up to 5% of children and can be associated with negative long-term consequences such as school dropout, social isolation, and unemployment (Guitar, 2010). While

stuttering treatment is effective (Guitar, 2010), the cost and time involvement is prohibitive, particularly for those of low socioeconomic status (e.g., new immigrants, rural and inner city families). Speech-Language Pathologists teach new speech skills to clients who stutter. Two key principles that influence how well a client who stutters can use new skills out in the real world are practice and feedback. This project examined which types of practice and feedback optimized learning and transfer (using new skills outside of the clinical setting) of a stuttering therapy technique called pausing. This project is unique because no previous research has focused on comparing the effectiveness of different speech therapy techniques to save time and costs.

5. Innovations in Pre-School Education in Russia's Far East Region

Ekaterina Lepekha
Elizabeth Sandell, Faculty Mentor (Department of Early Childhood Education)
MSU Mankato

The research report shares contemporary innovations in early childhood education in the Far East of the Russian Federation. Schools in the region have experienced innovations that parallel the changes in Russian society since the end of the Soviet period. Changes in society always involve transformation in pre-school educational institutions, known in Russia as "kindergartens." Teachers are introducing innovations to develop new opportunities and to meet the needs of pre-school children and their families. Creative, professional, and educational activities are emerging to provide conditions to meet new requirements.

6. Plague of the Black Dog

Ann Kopitzke
Tom Williford, Faculty Mentor (History Program)
Southwest MSU

British Prime Minister Winston Churchill's mental health—he was bipolar—affected various aspects of his life, including his ability to lead a nation during World War Two. Despite his affliction—and sometimes because of it—he was able to live a productive life, both personally and professionally.

7. The Community's Awareness of the Children's Museum of Southern Minnesota

Marcie Woitas and Amanda Hunstad
Heather Von Bank, Faculty Mentor (Department of Family Consumer Science)
MSU Mankato

Children's museums play a vital role in the development of young people's social, physical, and emotional development. But most of all, museums allow children to play. Play provides a foundation for exploration, observation, discovery, and experimentation in childhood. We know that children from low-income and racial minority groups often experience a disconnection from school and suffer academically. Because our community is becoming more ethnically and economically diverse, addressing the accessibility gap between affluent and disadvantaged families is something that should be addressed. The current research study examines findings from two surveys that were created in partnership with the Children's Museum of Southern Minnesota. The survey addressed how accessible the children's museum is to disadvantaged households and the level of awareness the community has about the museum working

toward a permanent facility, various payment plans, and issues concerning transportation. A short survey was distributed to members of the community who are low-income during three community events. The results of the surveys will assist the Children's Museum of Southern Minnesota to serve disadvantaged families and bring the benefits of play to all children in the community.

8. "The Empty Pages of History"; Everyday Life of Jewish Children in the Holocaust

Julia Viviana Santiago
Tom Williford, Faculty Mentor (History Program)
Southwest MSU

The effects of the Holocaust were different for every victim, but for the Jewish children the effects were greater and more traumatic; and frequently ended with their lives. The unimaginable happened, and for the children they could only ask why. This study is based on researching biographies and journals of several Jewish children living in Europe during 1938-1945 who experienced the Holocaust. Their stories begin in the homes they had been raised in, then continue to their new homes in the ghettos, and end in the camps for those who made it that far. Those few who were "lucky" enough to survive are able to reflect on the decisions that were made regarding the fate of the Jews and the effects that the Holocaust still has on their lives today.

9. Analysis of IT Project Failures from a Multi-Cultural Perspective

Zainab Hamza
Susan Schilling, Faculty Mentor (Department of Information Systems)
MSU Mankato

This project will focus on the importance of project management as a fundamental base for the success Information Technology projects, with the relation to multicultural aspects. Information and Communication technology has a high ratio in project management failure; this ratio is for all IT projects around the world. By that it is important to understand the reasons behind IT project success and failure, as well as spotting the light on the specific countries in order to understand the metamorphosis of cross-cultural IT views. This project will discuss reasons behind Information Technology project failure, in relation with the demographic of the IT projects. Even though, within the similarities and global standards in the IT field, still many projects vary and fail in regards of the relation with demographics. Different countries are having different approaches, in order to fulfill the cultural restrictions or the countries rules and regulation. This research emphasis on the project management methodologies in IT firms and organization, and will contain detailed causes and factors of having unsuccessful projects in different countries and international IT organizations. In order to understand the IT projects, in this research the majority of data is collected through research papers or scholarly articles. In addition, to have the full comparison of different countries, the focus of the research is on IT companies CEOs and IT manager in Middle Eastern countries. The basic statistics and graphs are referred to researches that touch the IT projects aspects. The anticipated results of this research are the focus on the IT projects with the use of global standards and case studies to implement a successful IT project. Also some of the expected results are to reach to the main causes that lead IT projects to be incomplete, over budget, or need extension.

10. A New Information System to Track Graduation Time Lines

Bruce Merrell, Alex Holm, James Martin and Tyrone Sellner
Mark Schmidt, Faculty Mentor (Department of Information Systems)
St Cloud State University

Maverick Software Consultants have a step by step process which helps students find a job when they are finished with college. Currently they keep track of students' progress manually and, with there being so many different steps, some students miss a step or a step gets overlooked. With the system we are creating, it will automate the current manual system and alert students and managers of any upcoming steps that need to be completed. It will also let the manager know when a step as been completed or has not been finished in a timely manner.

11. Is the American Dream Dead Among College Students?

Kathryn Olson
Kristin Scott, Faculty Mentor (Department of Marketing)
MSU Mankato

Is the American Dream Dead among College Students? Significance of the Research Project one of the key components of the American Dream is that success and happiness in life is dependent on procuring monetary wealth. This Dream has created a materialistic society where having the big house, nice car, and home appliances are more important than social issues. However, values might be changing due to economic, environmental, and humanistic reasons (poverty, fair trade, etc). To become a more sustainable society, significant changes need to be made. Are these changes already taking place among college students? Method Data was collected at a Midwestern University through an online survey administered by Survey Monkey. Participants were recruited through two different methods to ensure a variety of majors and classification. A total of 487 students completed the survey. The survey consisted of both open-ended and closed-ended questions. Frugality, environmental concern, and materialism scales were created to measure the extent to which these students saw their American Dream as being similar to the traditional Dream. Findings/ Conclusion: The results of this study suggest that the American Dream is not dead among college students. Instead it is a fluent concept that allows for multiple interpretations. Certain aspects of the traditional American Dream, such as being better off than the previous generation, may not be as relevant to younger generations. Importantly, the younger generation believes that although the Dream is not outdated, it should include aspects such as family, happiness and personal fulfillment and sustainability goals.

12. Achieving Sustainability for a Health Outreach Traveling Service

Georgia Stumpf and Megan Isackson
Amy Reitmaier and Carrie Spier, Faculty Mentors (Department of Nursing)
Winona State University.

There is an increasing population in the United States who have a need for preventive health services but have no access to healthcare. Literature shows that without regular access, underserved individuals ignore warning signs until their condition becomes a critical problem, leading to increased emergency room visits and hospital costs. Free health outreach programs provide health promotion and preventive services and close the gap between this underserved population and primary care. However, barriers, such as

limited funding, have made sustaining services difficult. The purpose of this honors project is to assist the Winona State University nursing faculty in furthering the development of the faculty led, student run, health outreach traveling service and to explore resources for sustaining this project. The WSU Health 2 U service provides health promotion and monitoring services to underserved populations, offering preventive health services and educational interventions to those without healthcare access. The honors project used a semi-structured interview method to learn from six different free clinics in the nearby rural and metro area. Questions focused on how these clinics established sustainability, provided for their initial funding, barriers that they have encountered in the progression of their health service, and evaluation of their clinic's performance. Results thus far have shown successful sustainability related to community involvement and partnerships, local medical and public health center support, clearly defining services provided, and developing an organized financial and administrative structure. Further research is warranted to examine current literature and additional synthesis of sustainable methods utilized by existing health services.

13. Cultural Competency Increases the Effectiveness of Health Education in Guatemala, Particularly When Addressing Malnutrition

Amie Bartlett
Jane Bergland, Faculty Mentor (Department of Nursing)
MSU Moorhead

Helps International, a non-profit organization, is helping alleviate poverty in Latin America. Through Helps International medical trips, volunteers are providing culturally congruent health education, specifically about nutrition, to the people of Guatemala. Such health education is desperately needed in Guatemala, which has one of the highest rates of malnutrition in the world. It is estimated that in some rural villages, up to 80 percent of people suffer from chronic malnutrition. Malnutrition in Guatemala is not always due to lack of food, but rather lack of food rich in vitamins and nutrients. Diets in rural Guatemala consist mainly of rice and beans, which do not contain all the vitamins and nutrients necessary to grow and thrive. Malnutrition in babies and young children causes stunting of growth. Early stunting of growth is linked to lower IQ and decreased earning potential. As a result, the poverty cycle in Guatemala perpetuates the problem of malnutrition. Understanding cultural aspects of the malnutrition problems in Guatemala increases the volunteers' ability to communicate health education to Guatemalans effectively. Once the cultural barrier is broken, the Guatemalan patients are more likely to understand and appreciate the importance of incorporating balanced nutrition into their diets.

14. Stearns County Public Health Breastfeeding Resources

Jenita Teachout and Heather Martell
Melinda Hiemenz and Jo DeBruycker, Faculty Mentors (Department of Nursing)
St Cloud State University

Stearns County requested that we assess needs for improvement in relation to resources available for the promotion of breastfeeding. A descriptive research study was conducted through interviews used to assess the professionals' views of current breastfeeding resources. The results of research found that the majority of agencies surveyed in Stearns County believe that they have adequate resources for women, but 60% of agencies see room for further improvement. Stearns County should continue to work with

clinics and hospitals to improve their availability and quality of resources regarding breastfeeding for their clients.

15. Parental Satisfaction with Involvement at Child Care Center

Amanda Hunstad and Marcie Woitas
Heather Von Bank, Faculty Mentor (Department of Family Consumer Science)
MSU Mankato

The purpose of this research was to examine levels of parental involvement at a local childcare center. Specifically, we sought to understand the level of involvement that parents wanted to have, and how satisfied they were with a recent Parent's Night event. Parents tend to have low levels of involvement at their children's daycare centers due to busy schedules and lack of opportunity. However the role that parents play in their child's education can have lasting effects on their academic and cognitive development. This study examines findings from two surveys. Results from the first survey, evaluating parent's current and prospective levels of involvement, found that parents were eager to attend and participate in a parent's night event. The second survey addressed parents' satisfaction and evaluation of the parents' night, in addition to discovering ways to improve attendance of future family events. The results from this study will provide the child care center with information about parent's expectations for involvement and will address the feasibility of parents' night programs in the future.

16. Community Assessment of Diabetic Foot Ulcers in Concepción, Chile

Diana Gehrman, Katherine Piehl and Johanna Mahoney
Melinda Hiemenz and Vonna Henry, Faculty Mentors (Department of Nursing)
St Cloud State University

Little is known about patient's resources and knowledge of diabetic foot ulcers in Concepción, Chile. The nurses of the Centro de Salud Familiar (CESFAM) understand that patients with diabetic foot ulcers lack the knowledge and resources about their ulcers. A descriptive research study using a paper survey was utilized with convenience sampling. Participants were anonymously surveyed and reassured that their identity would remain confidential throughout the process. This study revealed more information about patient knowledge and resources related to diabetic foot ulcer care in Chile, but further research is still needed. A majority of the patients surveyed believed that their diabetic foot ulcer was a disease and not diabetes. Patients did not have adequate knowledge of the association between diabetes and diabetic foot ulcers, however reported adequate resources and ability to care for their diabetic ulcers. Most patients stated that the nurses fully answered questions about their diabetic foot ulcers. Some patients were not always capable of attending all of their diabetic foot care appointments in the CESFAMs. The implication of this study is the lack of adequate education about the complications of diabetes in the community. It needs to be noted that cultural differences can affect how patients view their knowledge and capability of their diabetic ulcer care. Based on the interpretation of the findings, patients with diabetes have a need for increased education pertaining to diabetic ulcers and their complications. In regards to availability of resources some patients would benefit from receiving home care for their diabetic ulcers.

17. Breaking the Silence: Perceptions of HIV/ AIDS Among African Americans in the United States

Thomas Vincent
Jacquelin Vieceli, Faculty Mentor (Department of Political Science)
MSU Mankato

Over the recent years, there has been an alarming increase in the population of individuals infected with the HIV virus in the U.S; however, it is infecting African Americans at a disproportionate rate as compared to other ethnic groups. Statistically, blacks make up about 14% of the US population but account for over 50% of all new cases of HIV, a rate that is 8 times greater than that of whites. This research is geared to uncover the reasons behind the alarming rates of infection by assessing the social, economical and behavioral determinants of health among African Americans living in the US. It also seeks to understand if underlying factors such as gender and sexuality have a significant role to play in one's level of awareness. The research was conducted by reviewing the literature of two documentaries. These two sources were used to assess knowledge of HIV/AIDS among African Americans as it pertains to the individual and their community. The results of the research were very disconcerting and indicated that many African Americans were oblivious to the consequences that HIV/AIDS had within the Black community. Lack of education, stigma, a "down-low" lifestyle, high rates of incarceration, violence and the disempowerment of women were some to the themes that came up repeatedly. Being aware of one's status, knowing the risk factors and having an open discourse about the impact of the disease were key steps that need to be taken in order to break the silence of this epidemic.

18. Class Standing – Does it Effect Civic Engagement?

Laura Lake
Kara Lindaman, Faculty Mentor (Department of Political Science and Public Administration)
Winona State University

There is often a stigma surrounding college students - that they are uninvolved in both their campus and local community. The role of higher education should include creating a civically minded student, who should grow as the individual obtains more education. This research studies a possible relationship between class standing and civic engagement by asking - do more years of education create a more civically engaged student? Two-hundred Winona State University students were given a survey with questions that encompassed civic ideals: participation in the electoral process, community volunteering, and on campus involvement. All classes were surveyed based on percentages of class enrollment; for example 32% of the campus population is freshmen, and, therefore, 64 of the 200 individuals questioned were freshmen. The surveyed reviled that increased class standing (or more schooling) does not have a direct effect on civic engagement. Highest levels of civically engaged students lie within the freshmen and senior class standings, rather than being an exponential growth. Closing the gap between freshmen and senior civic engagement by better including sophomores and juniors is a task Higher Education should focus on to create lifelong engaged citizens.

19. Laptops in Classrooms: Evaluating Potential Benefits of Technology Against Distractions Part 3

Maria Almoite and Felicia VandeNest
Karla Lassonde, Faculty Mentor (Department of Psychology)
MSU Mankato

Laptop use in classrooms has sparked a debate in the teaching community about the advantages and disadvantages (e.g., distractions) of using laptops. To shed light on this debate, in a previous study we explored effects of different note-taking methods with either a pen and paper (handwriting condition) or a laptop (typing condition) on memory for text. We found that students in the handwriting condition did better on an assessment of the material compared to students who typed notes; results were approaching significance. The goal of the current study is to continue to evaluate the effectiveness of laptop use for note taking by asking participants to observe a video lecture. Participants will be assigned to either the typing condition (laptop) or the handwriting condition (pen and paper). They will be instructed to watch a non-psychology introductory video lecture (approx. 20 minutes), and will be asked to take notes on the lecture as if they are going to be tested on the material. After a short distracter task, participants' memory for the lecture will be tested using a combination of multiple-choice and fill-in-the blank questions. A week later, participants will be given the same assessment test to determine if encoding method (laptop vs. handwritten) influences long-term retention. We hypothesize that participants in the handwriting condition will have a higher retention rate than those who are in the typing condition for both short and long-term retention. We hope that results will inform both students and teachers about best-practices in note taking.

20. Discrimination of Emotion in Music: An Eye-Tracking Study

Megan Boeddeker and Bria Itzen
Elizabeth Nawrot, Faculty Mentor (Department of Psychology)
MSU Moorhead

Emotional expressions can be communicated through different cues, including facial expressions, tone of voice, even music. Past research has shown that adults, as well as children and infants are able to judge the emotional content from these cues correctly and consistently (Nawrot, 2003). In addition, happiness and sadness are easier to identify even in unknown musical stimuli (Mohn et. al., 2010). In this study, 45 undergraduate students were presented with affectively concordant and discordant pairs of facial and musical stimuli and asked to rate the affective concordance and discordance. In addition, their eye movements were recorded using infrared eye tracking. Results show that participants did, in fact, rate affectively concordant and discordant pairs significantly differently, $t\,(44) = 13.56$, $p = 0$. Preliminary eye-tracking data further indicates there are differences in gaze patterns between the concordant and discordant pairs. This suggests that people may analyze emotionally concordant and discordant stimuli differently at an early level of processing.

21. Doing Research on Research: Assessing Factors That May Influence Student Research Participation in Psychology

Stacy Anderson
Karla Lassonde, Faculty Mentor (Department of Psychology)
MSU Mankato

Hundreds of college students participate in research every year. Although participation is voluntary, it is a critical part of research productivity. We examined archival data collected from the Fall of 2012 and Spring of 2013 using the Psychology Department's research management system called SONA. Within this data, we were particularly interested in studies that had a high rate of 'no-shows'. No-shows occur when a participant signs up for a study, but does not show up for either an excused or unexcused reason. A new policy was implemented for the spring 2013 in hopes to lower the high number of no-shows. We gained valuable insight into the utility of this new policy by comparing semesterly data and surveying faculty who rely on the system for research. One implication of a high rate of no-shows is that research is often conducted online vs. face-to-face. This and other insights from this archival analysis will be discussed.

22. The Influence of Academic Motivation, Academic Ability, and Self-Esteem on Academic Performance

Tracy Kellen, Kayli Timm and Kaeley Rolland
J. Corey Butler, Faculty Mentor (Department of Psychology)
Southwest MSU

Two studies with a total of 306 participants examined the statistical relations among the variables of academic motivation, academic ability (as measured by ACT), self-esteem, and academic performance (as measured by college GPA). Multiple regression analyses indicated that motivation and ability were unique, moderate predictors of grade point average. The result for self-esteem was not statistically significant. In Study 1 there was an interaction between self-esteem and motivation, such that highly motivated students with low self-esteem received the best grades, and poorly motivated students with high self-esteem received the worst. This effect was not replicated in Study 2. The results are discussed in terms of current theory on motivation, self-esteem, and performance.

23. Examining The Use of Extended Time Accommodations at a University Setting

MaryBeth Armstrong and Daniel Spencer
Carlos Panahon, Faculty Mentor (Department of Psychology)
Melissa Stewart and Marcia Sytsma, Graduate Student Mentors (Department of Psychology)
MSU Mankato

Test accommodations are commonly defined as a change in testing materials or procedures that enables students to participate in assessments in ways that reflect their skills and abilities as opposed to their disabilities. These accommodations commonly include changes in presentation, response, setting, and/or scheduling of the assessment. Examples of some common test accommodations are extended time, separate room, and test reader. To gain access to test accommodations, it is the student's responsibility to provide documentation of the disability from a professional specialist. Once a student is approved for test accommodations, he or she must work directly with the university's Office of Disability Services to

utilize the test accommodations throughout the school year. Although extended time has been found to be a preferred accommodation for students with disabilities, little research has been conducted on the actual utilization of this accommodation. Therefore, the current study investigated the usage of the extended time test accommodation at a public university in the Midwestern United States by examining archival data obtained from the university's Office of Disability Services. Descriptive analyses compared standard exam times with actual time spent completing exams by students with extended time accommodations. It is hypothesized that a majority of students who utilize this test accommodation do not require the additional. Rather, it is hypothesized that students use the extended time option to decrease test anxiety. Implications of these findings will be discussed.

24. Surveying Teachers About The Use of Stability Balls As An Intervention

Nicole Kafka and RaeLynn Limberg
Carlos Panahon, Faculty Mentor (Department of Psychology)
Natasha Olson, Graduate Student Mentor (Department of Psychology)
MSU Mankato

Stability balls, which are commonly used for physical fitness, have become a recent interest among educators as a classroom intervention. Educators implement stability balls as an alternative to traditional classroom seating with the intent to improve inappropriate behavior and academic engagement. However, there is little empirical support for their use and effectiveness is lacking. For the purpose of this study, an 18-item questionnaire was administered to teachers in a Southern Minnesota school district that have and have not implemented stability balls as a classroom intervention. The intent of the questionnaire was to uncover motivations for implementation, perceptions regarding effectiveness, and estimate the prevalence of stability balls in classrooms. It is hypothesized that teachers are motivated to use stability balls based on individual students' needs and are perceived as a beneficial intervention in lieu of experimental analysis supporting their efficacy.

25. Stereotypical Series: Portrayal of GLBT Characters in the Media

Lauren Teal
Kerry Livingston, Faculty Mentor (Department of Sociology)
Southwest MSU

The current content analysis of broadcast and cable network television series running between 2010-2012 seeks to identify the representation of gay, lesbian, bisexual, transgender (GLBT) characters in shows known to have reoccurring GLBT characters. The scenes selected are based on the first appearance of a main character in the episodes sampled. The coding scheme used in this project is based on the early work of Cedric Clark. Clark (1969) established four stages of minority group representation in the media; non-representation, ridicule, regulation, and respect. Results from this study support the premise that gay and lesbian television characters have successfully passed through Clark's earliest stage of non-representation and mostly through the second stage, ridicule. The majority of television series analyzed have moved into the final two stages identified as regulation and respect. A gap still exists between where the media should be in the portrayal of GLBT characters and where they currently are.

26. Examining the Role of Intuition in Deception Detection

Chelsea Schmillen and Colette Baudoin
Emily Stark, Faculty Mentor (Department of Psychology)
MSU Mankato

Many people assume that logical thinking can help to detect deception; however, previous studies show that relying on intuition may be a better practice (Albrechtsen, Meissner, & Susa, 2009). The current research consists of two studies, which examine the role of intuition in deception detection. The purpose of Study 1 was to find if participants are able to implicitly and explicitly distinguish between truths and lies. Student participants in this study watched 16 video clips featuring a person telling a true story or a lie. Our results show that participants were implicitly rating the truth-tellers significantly more likeable and more trustworthy than the liars (all $ps<.05$); but they were not able to accurately distinguish the lies from true videos. This suggests that their intuition helped them detect the lies, but did not improve their explicit judgments of deception. Study 2 presents participants with shorter video clips to see if this improves their intuitive ratings and accuracy. The current data for Study 2 shows that participants are still at chance levels for explicitly detecting deception. However, and contrary to previous research, these findings also reveal that participants no longer intuitively distinguish between true stories and lies. Participants may not have had enough time to make an intuitive judgment, which in turn led to difficulty in detecting lies. Our findings from both studies expand on previous research and may be beneficial to many professions including crime investigators and social workers as well as in jury deliberations and everyday social situations.

27. Shelter Life

Jamie Linnemon,
Ruth Charles, Faculty Mentor (Department of Social Work)
Winona State University

Every 9 seconds in the US a woman is assaulted or beaten, yet how many of these women will come to a Domestic Violence shelter and if they do, what are the demographics of these women? The purpose of this research project is to provide beneficial material to an agency in pertaining to the most common ethnicity, age, parental status, health status, relation to abuser and the previous location of residence of the adult clients living in a specific Domestic Violence shelter. The shelter has information on the people they serve, but it has not been analyzed. Data has been collected on adult clients living at the Domestic Violence shelter from 2007-2013. The researcher is analyzing the data collected that was entered into an Excel spreadsheet. It will be graphed to better visualize the significant data obtained. The results of the research will be given to the agency staff and community to help make them aware of the clientele they serve. Based on the data, suggestions for improvements or changes will be presented.

28. Investigating Teachers' Perceptions of Students With EBDs

Cassandra Schreiber and Ashley Kuemper
Carlos Panahon, Faculty Mentor (Department of Psychology)
Dana Shea, Graduate Student Mentor (Department of Psychology)
MSU Mankato

Teachers play an important role in the education of children with emotional and behavioral disorders (EBD). While parents and caretakers often are aware of their child's difficulties, educators witness the child's level of progress (VanGelder, Sitlington, & Morrison-Pugh, 2008). Teachers are these students' first advocates within the academic setting. Unfortunately, a majority of teachers working with these students are planning on leaving their positions within the next five years (Adera & Bullock, 2010). Therefore, it is important to examine teachers' perceptions regarding children with EBD in order to promote teacher satisfaction and lower stress. This study examined in-service teachers' perceptions of students with emotional-behavioral disorders as well as job satisfaction. Participants were general and special education teachers working in school districts throughout Southern Minnesota. Respondents completed an online survey with questions regarding professional interests, expected career paths, and reactions to stereotypical perceptions of students with EBD. Perceptions of in-service teachers were expected to vary among years spent teaching, percentage of time spent working directly with EBD students, and differing levels of coping abilities and methods. This study will reveal current perceptions in the teacher population, as well as where and when the perceptions arise. Results will be utilized to determine how to improve teachers' understanding of students with EBD and encourage better work environments for teachers who work with students with EBD. Implications of these findings will be discussed to increase professional support and career satisfaction.

29. LGBT Suicide Rates Among Teens in the United States

Katherine Bullock
Shannon Terry, Faculty Mentor (Department of Sociology)
MSU Moorhead

In the United States, the rate for suicide among teens who identify as lesbian, gay, bisexual, or transgender (LGBT) is significantly higher than that of their heterosexual peers. By examining various articles, I was able to illustrate just how significant the differences are between heterosexual and LGBT suicide rates in teens and where this problem is most prevalent in the United States. By doing this, I was able to make a connection as to why certain areas have a higher rate of LGBT youth suicide and then draw conclusions as to how best to alleviate this problem. With this knowledge, I hope to push for solutions to significantly lower the rate of LGBT youth suicide in the United States.

30. Impacts of Toxic Wastes On Somali People Who Live Along The Coast

Ahmed Shiiraar
Raymond Asomani, Faculty Mentor (Department of Urban and Regional Studies)
MSU Mankato

The main principle of this research is to collect and report all available evidence of highly toxic wastes (HTW) dumped in Somalia to contribute a long term researches about toxics in Somalia. Since this case was a life-threatening case, I always had in my mind that I will one day conduct research about it. My

passion has increased last year, when I did joint research project about “Rout causes of Somali piracy”. As the result that research has broadened my thinking and fortunately, last fall, I received McNair achievement program fund and I selected my research for this issue. According to Greenpeace, many developing countries, especially African countries, have been victim of the adverse effects of highly toxic wastes (HTW) originated from the developed countries but the case of Somalia is particularly preoccupying. The country has been subjected to excessive illegal dumping operations of toxic and radioactive wastes for three decades. These wrong doing operations have taken place both along the coast and its adjacent land and had drastically effected on health, environment and the future prospect of sustainable development of the local population This research is based on authoritative sources and careful analyzed facts done by UN, private institutions, international NGOs with the same conclusion of toxic wastes dumped in Somalia. The conclusion of this research highlights desperate need of field experts and capacity building in support of greater funding for the effects of toxic wastes research since Somalia doesn’t have the capability to conduct those types of research.

31. Invisible Women and the Flood of 2009

Kathryn Kottenbrock
Claudia Murphy, Faculty Mentor (Department of Women’s Studies)
MSU Moorhead

My poster will focus on how the flood of 2009 affected homeless women in Moorhead, Minn. A survey will provide data from women about the challenges and successes they lived through during the flood. Since much current literature focuses on the plight of middle-class people, the data will provide information on a missed area of research in order to provide insight on work that needs to be done to protect vulnerable populations in the Red River Valley. Interviews will provide information about the role of shelters in creating a safe environment. The survey will also provide data concerning the plight of women living in conditions of poverty in natural disasters and contrasts to women who are homeowners. In the study, I hope to see if there are needs that should be filled and if there is policy that needs to be proposed.

32. Feminist Perspectives on the Flooding Red River of the North: Students and Flood of 2009

Tiffany Zilka
Claudia Murphy, Faculty Mentor (Department of Women’s Studies)
MSU Moorhead

The effects of flooding can be disastrous. Families are forced to gather what few precious possessions they can and leave. Students are a source of free labor for flood-fighting efforts. A survey will provide information about the situations of college students during the flood of 2009. What are the consequences to students as a result of being asked for free labor? What is the impact on students after all the work is done? Where did students go when classes were still in session or cancelled, and some of their dorms and houses evacuated? What happened to students who live out of state or to international students? When students have to leave their residences, they are put in new positions. Many became homeless. Students completed surveys to provide data about the situations in which they found themselves and the how they coped with the change. With the other material presented, this will bring a new local perspective to flooding and its effect on students.

33. Ecuador's Indigenous Groups and Emigration

Myra Colakovic
Elizabeth Harsma, Faculty Mentor (Department of World Languages and Cultures)
MSU Mankato

Indigenous groups in Ecuador and their traditions, cultures, values, and environments are greatly affected by the majority population. Many Ecuadorians emigrate every year to the United States and Spain for a variety of reasons. The purpose of my research is to investigate how Ecuador's indigenous groups are affected by the majority population and why some Ecuadorians choose to migrate to other countries. I performed this study by researching a variety of sources on this topic, such as research books, peer-reviewed scientific articles, and reliable online resources to achieve my results. By better understanding the relationship between mainstream populations and indigenous groups, and studying how many groups do preserve their culture and often thrive, we can better learn how to ensure the well-being of these groups. Through this investigation, we learn the reasons and details of Ecuadorian emigration, which can have cultural, social, and economic effects in different countries.

34. "Girl"

Jayme Wiertzema
Ryan Muldowney, Faculty Mentor (Department of Art)
Southwest MSU

My piece was inspired by artist Chuck Close. Close likes to focus on tonal values and carefully selects values according to their similarity to the actual values in a photographic image. I mimicked Chuck Close's strategies by including a full-range scale of tonal values in a piece of art made solely of hole punches. I worked with a range of gray papers, as well as black and white. Hole punches were cut and placed onto a printed image; carefully selecting and matching the tone of the hole punch to the tone on the image. In Close's work, he might have used hand-made paper that he tore himself to create the same affect. In this project, it was important to observe the subtle shifts in light and shadow, form and volume and maintain extreme focus while doing so.

35. Ecosystem Tower Puzzle Game Demonstrates Sustainable Food Systems Model

Aaron Murray and Thomas Gorycki
Janet Macon, Faculty Mentor (Department of Health, Exercise and Rehabilitative Sciences)
Winona State University

Winona State University launched the interdisciplinary Sustainability Minor program in the fall of 2011. Nutrition for Lifetime Wellness, a 200-level lecture/lab course in the Health, Exercise and Rehabilitative Sciences department (HERS), is included in the curriculum. Seeking an interactive tool to demonstrate the vitality of inputs in the Sustainable Food Systems Model (ADA) to the 550 students who take this course each year, faculty piloted an ecosystem tower puzzle game in Fall 2012. The game demonstrates that, "The nation that destroys its soil, destroys itself (Franklin Roosevelt)." This lab was cited as one of three most impactful of the semester by 32% of students who completed course evaluations. In Spring 2013, HERS faculty partnered with Sustainability Minor students to create a second generation prototype. Minor students designed and labeled each of the 54 blocks in a tower puzzle with an organism within the Rochester, MN, Plateau ecosystem, then color-coded each block according to the organism's location in

the ecosystem, from soil-dwelling microorganisms at the bottom to humans at the top. As students in the nutrition course remove blocks from the tower, they discuss factors impacting that level of the ecosystem. When the tower falls, students research the organism listed on the final block, and present a brief summary of its role in a sustainable food system to the class. This three-dimensional, visual and kinesthetic modality provides students with a relatable simulation of an ecosystem that is both too small and too large to be seen by the human eye.

Economics

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1. **Economic development in mid-sized cities: A case study of urban transportation in Fargo-Moorhead**
   Ka-wai Lau
   Tonya Hansen, Faculty Mentor (Department of Economics)
   MSU Moorhead

2. **The Relationship Between State Government Political Ideology and Deficit**
   Curtis Gruidl
   Ihsuan Li, Faculty Mentor (Department of Economics)
   MSU Mankato

3. **Is language a barrier to foreign direct investment?**
   Rachel Hettich
   Tonya Hansen, Faculty Mentor (Department of Economics)
   MSU Moorhead

4. **An Analysis of Labor and Infrastructure Issues Brought by the North Dakota Oil Boom**
   Ozlem Barin
   Ihsuan Li, Faculty Mentor (Department of Economics)
   MSU Mankato

1. **Economic development in mid-sized cities: A case study of urban transportation in Fargo-Moorhead**
Ka-wai Lau
Tonya Hansen, Faculty Mentor (Department of Economics)
MSU Moorhead

Urban transportation, as defined by O'Sullivan (2006), includes both auto and mass-transit systems used by residents within an urban area. Despite comprehensive transportation research conducted in large cities, limited research focuses on adapting mid-sized metropolitan areas such as Fargo-Moorhead to include both public and private transportation options commensurate with economic and population growth trends. Past expansions of transportation infrastructure in Fargo-Moorhead focused primarily on car users, not transit users. This research employs cost-benefit analysis to identify the long-term economic, social and environmental factors associated with a comprehensive urban transportation system in Fargo-Moorhead. Using publicly available data from the Fargo-Moorhead Metropolitan Council of Governments, the U.S. Census and the city of Fargo, this research assesses the cost effectiveness of public transportation in the Fargo-Moorhead metropolitan area, with emphasis on demographic factors that influence demand.

2. **The Relationship Between State Government Political Ideology and Deficit**
Curtis Gruidl
Ihsuan Li, Faculty Mentor (Department of Economics)
MSU Mankato

The primary aim of this research seeks to discover whether the political ideology of our elected leaders will influence government spending and deficit. This study will also contribute to the extensive literature and research on the effects of political orientation and ideology. Particularly by analyzing a larger and more recent data set across the 50 states while focusing thoroughly on revenue and spending by state. State Government data from 2000-2010 was used to specify revenue and spending models. These models identify many important economic and political determinants. Elected officials are now under more scrutiny than ever to perform well, specifically dealing with the perpetual issues of spending and deficit. United States citizens have a constitutional right to elect the official they believe will govern the best. In most cases, voting isn't directed toward personal aspects but instead towards the candidate's political ideology. People vote differently because they subscribe to different political ideologies, depending on their norms and assumptions about the functioning of society (Bjornskov, 2004).

3. **Is language a barrier to foreign direct investment?**
Rachel Hettich
Tonya Hansen, Faculty Mentor (Department of Economics)
MSU Moorhead

Foreign direct investment (FDI) is often explained by interest rates, exchange rates or distance, but language barriers may be an overlooked, yet influential, explanatory variable. Inward foreign investment is a critical part of economic growth for every country. The Language Barrier Index (LBI), constructed by Johannes Lohmann, was previously used to show that language barriers reduce trade between nations. Language barriers introduce transaction costs that could be eliminated through increased understanding of

the “barrier language.” This research includes the LBI, along with distance, GDP and other geographical and historical variables, in the gravity model to estimate a regression of the impact of language barriers on FDI. If language barriers are found to impact FDI, countries could allocate more resources to language proficiency in order to attract investment and spur economic growth.

4. An Analysis of Labor and Infrastructure Issues Brought by the North Dakota Oil Boom

Ozlem Barin
Ihsuan Li, Faculty Mentor (Department of Economics)
MSU Mankato

This paper analyzes the major issues concerning labor force and city infrastructure as a result of the oil boom in North Dakota. While sudden increases in natural resources provide opportunities for economic growth it also creates challenges for residents and public administrators. Previous studies have examined the short and long term impacts of these sudden natural abundances and the results show that the impacts could be either positive or negative depending on the sufficiency of labor force and city infrastructure. This paper asks: 1) what will be the short and long term impact of growing immigration due to the oil boom and how will these sudden unexpected changes in population affect the labor force dynamics and existing infrastructure in North Dakota? 2) How to prevent from the negative effects of recourse booms so called “Dutch Disease”? 3) How can policy makers meet urgent needs of growing population with limited government financial resources? These issues are analyzed in lights of historical similarities and differences of oil booms in North Dakota and Texas which enjoyed the positive effects. To find the answer for these research questions, I collected historical annual data set from 1951-2011, for North Dakota, Texas and U.S. and the data is divided in 3 periods of according to the booms occurred during the history. I used t-test of mean and difference in mean, t-test of proportion and difference in proportion, and chi square test of independence to analyze the relationship between the variables by using the Stata software V.11.

History

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1. **Captain America, Politics, and Social Movements**
   Christian Brown
   Tom Williford, Faculty Mentor (Department of History)
   Southwest MSU

2. **Civil Commitments and Legal Regulations of Sex Offenders in the Late Twentieth Century**
   Amanda Larsen
   Heather Hawkins, Faculty Mentor (Department of History)
   Winona State University

3. **The Great Deceiver in Milton and Tolkien**
   Maureen Hukill
   Henry Chan, Faculty Mentor (Department of History)
   MSU Moorhead

4. **The Green Revolution in India**
   Heidi Zimmerman
   Sumiko Otsubo Sitcawich, Faculty Mentor (Department of History)
   Metropolitan State University

1. Captain America, Politics, and Social Movements

Christian Brown
Tom Williford, Faculty Mentor (Department of History)
Southwest MSU

Media portrayal has a huge impact on what society thinks of these people, countries, or events. The creators and writers of the comic books know this and used it to their advantage. As a result, many superheroes or villains represent social and political movements, and both sides of a particular issue. This created a medium for youth through which they could understand the events of the time in a way that related to them. Comic book superheroes have been and will continue to be a force of media for all. This is evident by the emergence of the popularity of superheroes through a different media, the movies. With the presence of these heroes, many people will start to have empathy for groups of people fighting for equality or people that are oppressed or to feel a sense of nationalism. In relation to the context of superheroes and their meanings, there is one superhero that stands out as the most powerful. This superhero is Captain America, and he was and continues to be a literary representation of events happening at any point in history. Throughout his time in the pages of comics, he has been known as a symbol for nationalism, secret black operation events, and the fight against corruption, and the fight against bullies of any kind.

2. Civil Commitments and Legal Regulations of Sex Offenders in the Late Twentieth Century

Amanda Larsen
Heather Hawkins, Faculty Mentor (Department of History)
Winona State University

Historically the punishment for sex offenders has become increasingly more developed with regulated governmental control, and the constant changing of the legislation as society and the law start to define the category of sex offenders. One common way that society has devolved to deal with sex offenders is to place them in confined commitment centers in the hopes that they can become cured. But a common question is who has the authority to force them to go to treatment? My paper looks at the ways courts and legislation has dealt with these issues. In the 1997 *Kansas v. Hendricks* case the United States Supreme Court upheld the state's decision to civilly commit Hendricks after his prison sentence. In 2010 the Supreme Court ruled that Congress has the authority under the constitution to allow the continued civil commitment of sex offenders after they have completed their criminal sentences. Today every state has a "civil commitment" laws that allow for the involuntarily hospitalization of people with serious mental illness. The public outrage towards sex crimes, especially sex crimes against children, has resulted in demands for harsher penalties for sex offenders and better methods for managing them in the community. Interestingly these laws are often affect men differently than women. Because of their nurturing status in American society women are not really considered to be deviant or even mentioned in the category of sex offender. Thus civil commitments are disproportionately handed out to male offenders.

3. The Great Deceiver in Milton and Tolkien

Maureen Hukill
Henry Chan, Faculty Mentor (Department of History)
MSU Moorhead

John Milton's "Paradise Lost" and J.R.R. Tolkien's "The Silmarillion" each engage the fortunate fall and present an evil character who, through his own free will, becomes the great deceiver. These two great works of literature describe their evil characters in a similar fashion: They each choose their own will instead of the will of God, and through examining the Petrarchan conceit and apotheosis in Milton and Tolkien's works, these characters' limited agency is shown through their movement.
This presentation analyzes the similarities between Satan and Melkor, and how both Milton and Tolkien use movement to illustrate the characters' limited agency.

4. The Green Revolution in India

Heidi Zimmerman
Sumiko Otsubo Sitcawich, Faculty Mentor (Department of History)
Metropolitan State University

While the Green Revolution wouldn't officially be titled as such until the late 1960s, it consisted of a period of time in which new high-yielding variety strains (HYVs) of staple crops; mainly wheat, but also including rice and maize, were introduced as a food package from the First World to the Third. The significance of this paper shows a need to identify terms such as "Green Revolution" and what we perceive as "green"; the concepts of a shark and rat strategy and how both are linked analogously with the U.S. and India during that time, and the effects of the relationship between the two. The difference between adaptation and adaptability will be addressed. This paper uses secondary sources from both countries to show examples of outcomes from the introduction of the Green Revolution during that time.

Biology, Chemistry

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1. **Survivorship of Men and Women from Lyon County, Minnesota during the Spanish Influenza Pandemic**
   Jessica Sheehan and Diana Moe
   E.A. Desy, Faculty Mentor (Department of Biology)
   Southwest MSU

2. **Translational Repression and P-body Formation: A Novel Cellular Response to Chromium (VI) Induced Genotoxic Stress in *S. cerevisiae***
   Whitney Hopfauf, Chris Bullard, Sara Segner, Blaine Rathmann and Tony Koch
   Ted Wilson and Scott P. Segal, Faculty Mentors (Department of Biology)
   Winona State University

3. **Empirical analysis of the effect of NCAA sanctions on the employment and wages of a city**
   Cody Brandt
   Tonya Hansen, Faculty Mentor (Department of Chemistry)
   MSU Moorhead

4. **Determining Common Factors That Influence Academic Success in Allied Health Chemistry**
   Alice Chan
   Heather Sklenicka, Faculty Mentor (Department of Chemistry)
   Rochester Community and Technical College

1. Survivorship of Men and Women from Lyon County, Minnesota during the Spanish Influenza Pandemic

Jessica Sheehan and Diana Moe
E.A. Desy, Faculty Mentor (Department of Biology)
Southwest MSU

The Spanish influenza was one of the most devastating pandemics in history, which infected one-third of the world's population in 1918-19. The purpose of our study was to determine that this pandemic had a larger death toll than other years in Lyon County, Minnesota. By conducting survivorship curves that included four cohorts, we obtain our results. The cohorts included female death in 1918-19, male death in 1918-19, female death not in 1918-19, and male death not 1918-19. Total sample group was 45,134 individuals. Graphs were conducted to show the individuals that died each year. The results showed that there was an increase in the number of individual death for the year 1918 in both male and female categories. The survivorship curve for male and female in 1918-19 revealed that individuals died at a younger age than the other years. The Spanish influenza did have an impact to Lyon County, MN.

2. Translational Repression and P-body Formation: A Novel Cellular Response to Chromium (VI) Induced Genotoxic Stress in *S. cerevisiae*

Whitney Hopfauf, Chris Bullard, Sara Segner, Blaine Rathmann and Tony Koch
Ted Wilson and Scott P. Segal, Faculty Mentors (Department of Biology)
Winona State University

Cellular mechanisms to cope with genotoxic stress are conserved across eukaryotes, suggesting fundamental importance to survival. Genotoxic agent, chromium (VI), is a potent carcinogen capable of damaging DNA by direct binding and indirectly through oxidation. Exposure to oxidation can result in lipid and nucleic acid damage and elicit a cellular stress response. Chromium (VI) oxidizes guanines resulting in 8-oxoG bases, induces double strand breaks, or generates abasic sites. Therefore, an oxidative stress response is crucial to maintain proper cellular function.

Upon exposure to a physiologic stress, cells control gene expression by repressing translation. Repressed mRNA may localize to P-bodies or stress granules; cytoplasmic structures where non-translating mRNA are found. While P-bodies contain mRNA degradation factors, stress granules contain translation initiation factors. Stress granules allow for storage of mRNA until removal of the stress, whereas P-bodies permanently remove mRNA from the translating pool.

Exposure of yeast to chromium (VI) mediated oxidation caused an increase in P-bodies, while stress granules failed to form. The response occurs within 10 min. of exposure and is dependent on translational repression. Interestingly, use of the antioxidant, quercetin, abrogated the increase in P-body formation during co-treatment with chromium (VI). Our data suggests a model in which damaged mRNA or mRNA transcribed from damaged genes are degraded rather than stored. We suspect oxidative damage may halt translating ribosomes on these mRNA, activating the no-go decay pathway. A deeper understanding of cellular stress mechanisms is clinically important as oxidative damage has been implicated in cancer formation and aging.

3. Empirical analysis of the effect of NCAA sanctions on the employment and wages of a city

Cody Brandt
Tonya Hansen, Faculty Mentor (Department of Chemistry)
MSU Moorhead

The expected benefits to a city of having a college football team result from the tourism activity generated by the team's fan base. Economic theory suggests that extra spending by tourists increases the demand for labor, causing both the number of employed people and their wages to increase. This research evaluates the effect that NCAA sanctions have on a city's employment and wages. Using data from 2001-2011, this research uses a time series model to measure the effect of sanctions on two cities (Starkville and Oxford, Miss.) with similar demographic characteristics, but whose college football teams possess alternative NCAA statuses. The Mississippi State football team in Starkville faces a sanction in the time period, while the University of Mississippi in Oxford does not. Research findings reveal whether and to what extent the NCAA is punishing both the football team and its host city when sanctions are issued.

4. Determining Common Factors That Influence Academic Success in Allied Health Chemistry

Alice Chan
Heather Sklenicka, Faculty Mentor (Department of Chemistry)
Rochester Community and Technical College

What are the factors that promote academic success in studying Allied Health Chemistry (CHEM 1117)? The connection between best practices by students outside the classroom and measures of academic success during a semester in CHEM 1117 were examined. Understanding the link between what measures successful students undertook will provide a core foundation for continued and/or improved academic performance for current and future students in Allied Health Chemistry. Undergraduate students in a CHEM 1117 course were surveyed about their use of available course resources over three different semesters at a public community college. Their responses were statistically measured and analyzed. The data collected was examined in an attempt to predict if a high GPA in Chemistry correlated with available resources and student self-assessment of which resources they found most and least helpful. The most commonly used resources were measured against unit exam and final course grades to determine if there was a correlation between these factors and success on assessments. The resources measured include (i) course materials (ii) instructor accessibility, (iii) self or assisted tutoring and (iv) technology. Preliminary results indicate that attending class lectures and doing competency assessments favor successful academic performance. Analysis could provide a more definitive conclusion to whether the productive use of available resources will ensure successful academic performance in Allied Health Chemistry. This work will lead to tools for future students to guide their choices of resources as the list of available resources continues to expand.

Automotive Engineering, Electrical Engineering, Mathematics and Computer Science

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1. **Electrical Charging Output**
   Nicholas Kolhoff
   Bruce Jones, Faculty Mentor (Department of Automotive Engineering Technology)
   MSU Mankato

2. **Analysis of Odocoileus Virginianus Data Collected in Upper Midwest**
   Lawrence Moeller, Jr.
   Derek Webb, Faculty Mentor (Department of Mathematics and Computer Science)
   Bemidji State University

3. **2013 Formula SAE Chassis and Suspension Research and Development**
   Scott Neil
   Gary Mead, Faculty Mentor (Department of Automotive Engineering Technology)
   MSU Mankato

4. **Low-Cost Integration of Camera and Motion Capture For Use in Pediatric Neuromotor Therapy Options**
   Eric Taintor, Eric Diep, and Melissa Hoppe
   Mohammad Habibi, Faculty Mentor (Department of Electrical Engineering)
   MSU Mankato

1. Electrical Charging Output

Nicholas Kolhoff
Bruce Jones, Faculty Mentor (Department of Automotive Engineering Technology)
MSU Mankato

It takes a substantial amount of power to run the entire electronic system in vehicles today. Automobiles are built to handle all these electronics, but not all small recreational vehicles can. When a small recreation engine is used for the Formula SAE event, electronics like fuel injection and data acquisition systems are added to the vehicle for performance and reliability. With these additions, the electronic power output of the charging system must be evaluated and upgraded if needed. Failure to have a proper charging system can result in a poorly running vehicle or a vehicle that does not run at all. After using an amp clamp and volt meter to measure the stock charging systems performance, a new upgraded system consisting of the stator and voltage regulator was researched and developed to test. The testing was done by putting maximum electrical load that the recreational KTM 525 motor would see, while making sure that the battery was still able to charge. The research paid off as the new charging system outputs about 35 percent more power than stock at 3,800 RPM. This is enough power for all of the electronics and charges the battery adequately. This research helped develop an understanding of charging systems and how to build one based on how much power is needed at a specific motor speed.

2. Analysis of Odocoileus Virginianus Data Collected in Upper Midwest

Lawrence Moeller, Jr.
Derek Webb, Faculty Mentor (Department of Mathematics and Computer Science)
Bemidji State University

A large and complex data set on the frequencies over multiple years and multiple locations of Odocoileus virginianus (white tail deer) was analyzed. Research and talk focus on the statistical process used from acquiring appropriate data to building a useable dataset. The data used was collected over multiple years at multiple locations and posed unique challenges which nicely illustrate the statistical obstacles faced in applied biological research.

3. 2013 Formula SAE Chassis and Suspension Research and Development

Scott Neil
Gary Mead, Faculty Mentor (Department of Automotive Engineering Technology)
MSU Mankato

The significance of the chassis and suspension team was to research and create a student designed formula car rolling chassis. It is very important to the automotive engineering department in particular because it brings together topics of our area of study and gives students a hands on approach, not only learning but also teaching others areas of importance in a vehicle. The chassis and suspension side is important because it is the area of safety in a vehicle; it protects and prohibits injury to a driver of a vehicle. Safety is a very important characteristic in any area of study and getting hands on learning experience has helped all involved in the project. There was research conducted all the way through this project not only through literature, but also through trial and error. Focusing on smaller goals just on the frame side of the project extensive research is spent on frame rigidity and structural strength to find the ideal design. Not only to protect the driver but to protect the vehicle from bending or twisting which

would in turn, lose abilities of other systems applied to the chassis. Several computerized programs were used to test the simulated rigidity and resistance of the frame to twist and bend in a real life situation. the same programs were also used on the suspension and suspension components.

4. Low-Cost Integration of Camera and Motion Capture For Use in Pediatric Neuromotor Therapy Options

Eric Taintor, Eric Diep, and Melissa Hoppe
Mohammad Habibi, Faculty Mentor (Department of Electrical Engineering)
MSU Mankato

Obtaining quantifiable data on pediatric walking patterns has numerous applications in the biomedical field, including diagnosis, treatment planning, and developing physical therapy options. Motion capture (or mocap) and video capture are two commonly used tools for recording these data. The purpose of the proposed project was to develop a low-cost system to: I) synchronize video data from multiple perspectives; II) record mocap data without attaching markers to the child; and III) integrate EMG, mocap and video recording in one user interface. The intended use for this system is to assist in pediatric therapy options for children younger than 18 months with neuromuscular disorders. The project was divided into three phases. The requirement for Phase I was to record multiple videos from several perspectives. In fall 2012, we successfully implemented a solution via C# programming. Our solution is a program that allows the user to record videos from multiple webcams simultaneously and also analyze videos. To meet this end, we explored various aspects and options for Phase I via decision matrices. We also started to study the Phase II, which involves recording and analyzing the mocap data collected from multiple Microsoft Kinects. One future implication of this project is the availability of a low-cost, non-invasive biomechanics imaging system for physical therapists. Other applications include educational and automated diagnosis of gait disorders.

English

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1. **Classical & Christian Values in Shakespeare's "Hamlet"**
   Dylan Brenner
   David Higgins, Faculty Mentor (Department of English)
   Inver Hills Community and Technical College

2. **Assumptions Based on Accent**
   Elizabeth Fink
   Elizabeth Kirchoff, Faculty Mentor (Department of English)
   MSU Moorhead

3. **Parallels between the Characters of Hamlet**
   Jamie Cleven
   David Higgins, Faculty Mentor (Department of English)
   Inver Hills Community College

4. **Eng444 Advanced Poetry Workshop - Class Reading**
   Thomas Delano, Lawrence Wiggins, Heidi Sampson, Max Peterson, and Lillian Lamoreux
   Roger Sheffer, Faculty Mentor (Department of English)
   MSU Mankato

1. Classical & Christian Values in Shakespeare's "Hamlet"

Dylan Brenner
David Higgins, Faculty Mentor (Department of English)
Inver Hills Community and Technical College

Many characters in Hamlet such as Laertes, Claudius, and Hamlet himself all struggle with a conflict between Classical and Christian values. Is it better to live a good and moral life and be usurped by people who do wrong against you, or if is better to die with honor knowing that wrongdoers have suffered by your hands? This is the key question to Hamlet's "To be or not to be" speech. This conflict is seen often throughout Shakespeare's play, especially by Hamlet, who seems to struggle more than any other character with his internal conflict of ethics that affects his actions in the play. My presentation examines how Hamlet's transformation in character affects his actions in the play and how Shakespeare uses Hamlet's personal and inner struggles to create a satire of the Elizabethan era. I'll research this topic by reading the play closely to see how Shakespeare disguises his double meanings in Hamlet. I'll also use scholarly articles such as R.A. Foakes's "Hamlet's Neglect of Revenge" to help present a better quality of information to show how Hamlet's behavior and transformation depicts Shakespeare's ridicule of Elizabethan politics. I intend to use texts from Hamlet to try and achieve a better understanding how Shakespeare uses double meanings to express his thoughts and opinions about life in his day. By performing an analysis of Hamlet's character transformation and his personal conflict between his Classical and Christian morals, it will give me a better understanding of Shakespeare's subplots and double meanings.

2. Assumptions Based on Accent

Elizabeth Fink
Elizabeth Kirchoff, Faculty Mentor (Department of English)
MSU Moorhead

Accents are an interesting topic when studying communication between people. Judgment based on accent alone can lead to misconceptions of an individual's personality. Thinking about dialect diversity made me curious: what do students on campus think about accents? Does our judgment improve when we learn more about other cultures and ethnicities?
To conduct my research I surveyed students from two classrooms. Class A was world religions, a class offered as fulfillment for general credit. Class B was only for students studying to teach English as a second language. My intent was to compare the assumptions that Class A students made to the assumptions that Class B students made, since the students studying to teach English as a second language were more likely to have had multicultural experiences. Through my research, I discovered that there were no large differences between the reactions given by Class A and Class B. This is a significant discovery because it may show that even though students study other cultures, they still make assumptions about variations in accent of the English language. Though this does not always have a negative result; it could possibly affect the way those students teach in the future.

3. Parallels between the Characters of Hamlet

Jamie Cleven
David Higgins, Faculty Mentor (Department of English)
Inver Hills Community College

This paper discusses the parallels between the characters of Hamlet, Laertes, and Ophelia throughout the play Hamlet by William Shakespeare. An examination of the parallels between the characters' experiences reveals their motivational differences and offers a greater understanding of the play as a whole. My essay reads critical scenes from the play as well as using character analyses from a variety of critical essays. My goal is to explore how the characters' parallels, such as their reactions of the murder of their fathers, the ways in which revenge is sought, and their upbringings, lead them to such different outcomes in the play. It will also look into the direct cause and effects of madness that is suffered by all three of them. The running theme of false seemings is another parallel between the characters, and it affects how they interact with others around them. The larger implication of this study is that Shakespeare's intent in writing Hamlet was to draw upon the experiences of the characters and show that the results of their actions were the same, despite different paths.

4. Eng444 Advanced Poetry Workshop - Class Reading

Thomas Delano, Lawrence Wiggins, Heidi Sampson, Max Peterson, and Lillian Lamoreux
Roger Sheffer, Faculty Mentor (Department of English)
MSU Mankato

Students will present various poems they have created and revised during the Spring 2013 semester, with brief explanations of what led to the creation of a poem and the techniques used in and out class to bring poems to their finished states. These presentations will encompass the various forms of theory and interpretation used throughout English courses at MSU, and ultimately argue how those practical tools of study lead to the creation of art. In the class poems are read aloud and timed, and students will use this practice to create a 7-10 minute collection of poems to read to an audience. These presentations will also stand as an example of the various literary arts that are being enjoyed and practiced by students within the English and Creative Writing classes.

Philosophy, Political Science

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1. **Limit the Family**
   Jessica Wierzchowski
   Marilea Bramer, Faculty Mentor (Department of Philosophy)
   MSU Moorhead

2. **Spring Survey of SCSU Student 2013**
   Karen Stay
   Stephen Frank, Michelle Hammes and Steven Wagner, Faculty Mentors (Department of Political Science)
   John Kulas, Faculty Mentor (Department of Psychology)
   St. Cloud State University

3. **The Necessity of Friendship: A Feminist Critique and Perspective**
   Kathryn Lucero
   Marilea Bramer, Faculty Mentor (Department of Philosophy)
   MSU Moorhead

4. **John Dewey and John Henry Newman: Education and Truth**
   John Goerke
   Marilea Bramer, Faculty Mentor (Department of Philosophy)
   MSU Moorhead

1. Limit the Family

Jessica Wierzchowski
Marilea Bramer, Faculty Mentor (Department of Philosophy)
MSU Moorhead

Overpopulation is a current concern because of the effects it can have on society in general and on the environment. One way to address overpopulation would be to encourage people to have fewer children. Some people have argued that individuals should stop having children altogether, while others have argued that restricting family size violates a fundamental human right to have children. This paper argues for a more moderate solution that addresses both overpopulation and the right to have children: Couples should be limited to having children at the rate of replacement. That is, couples would be able to have two children. This paper discusses the economic and environmental benefits of this restriction. The paper also addresses how adoption is a viable option for those who want to have a larger family.

2. Spring Survey of SCSU Student 2013

Karen Stay
Stephen Frank, Michelle Hammes and Steven Wagner, Faculty Mentors (Department of Political Science)
John Kulas, Faculty Mentor (Department of Psychology)
St. Cloud State University

BACKGROUND: The Saint Cloud State University (SCSU) Survey Research Center conducts a Spring survey of SCSU students regarding opinions and behaviors on various issues. The student survey is constructed by a group of student directors who have researched and study the issues and proper methods for collecting data. The questions consist of longitudinal data collection, director's interests on specific and current events and client questions from departments across campus. OBJECTIVE: The survey provides an opportunity to directors to work first hand with data collection methods as well as research analysis and professional presentation of results to the SCSU community. The topics often covered in the survey address issues such as safety, tobacco use and ban policy, drinking behaviors and beliefs, race and gender concerns and health and the environment attitudes. METHODS: The SCSU Survey is licensed to use Sawtooth Software's Ci3 Questionnaire Authoring Version 5.0, a state-of-the-art windows-based computer-assisted interviewing package. The SCSU Survey operates a Computer Assisted Telephone Interviewing (CATI) Lab on 19 interviewer stations; each includes a computer, a phone, and a headset. A representative sample of currently enrolled students is contacted via landline or cell phone for the survey. RESULTS: The student survey is a platform for student directors to incorporate research methods and practices into a professional grade presentation for the SCSU community demonstrating the opinions and behavior of the community.

3. The Necessity of Friendship: A Feminist Critique and Perspective

Kathryn Lucero
Marilea Bramer, Faculty Mentor (Department of Philosophy)
MSU Moorhead

Everyone (or almost everyone) has friends, and everyone (or almost everyone) needs friends. That being said, how many of us have thought of the role friendship helps us play in becoming better people? In this

paper, I will look at the different kinds of friendship and how friendships improve our sense of self in the world. I draw on the views of Aristotle, Kant and contemporary feminist philosophers to explain friendship and its value. I conclude that friendships give us experiences we cannot attain on our own. They help us learn empathy and help us understand our greater purpose in the world. Through our understanding of each other and ourselves as friends, we achieve moral growth and become better people.

4. John Dewey and John Henry Newman: Education and Truth

John Goerke
Marilea Bramer, Faculty Mentor (Department of Philosophy)
MSU Moorhead

The educational philosophy of John Dewey has become the unacknowledged framework for collegiate education in the 21st century. One hundred years after Dewey penned his works on the role of pragmatism in education and the vocation of the teacher as the new prophet, his ideas have become the bedrock on which the modern university is built. In this presentation, we will critically compare the educational philosophy of Dewey with that of John Henry Newman, the Anglican turned Catholic theologian and philosopher, who spent seven years of his life running a University in Dublin. His writings from this time include 'The Idea of a University', his treatise on educational philosophy. We will engage the topics of Truth, progress, the role of the student and the role of the teacher in each of these two philosophies with an aim evaluate the merits and shortcomings of each philosophical system.

Geology, Automotive Engineering

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1. **Formula SAE Shifting**
   Ethan Blomquist
   Bruce Jones, Faculty Mentor (Department of Automotive Engineering Technology)
   MSU Mankato

2. **Silica Remobilization in the Mesabi Iron Range: Mine Ore-Waste Cutoff Prediction**
   Ryan Rague
   Steven Losh, Faculty Mentor (Department of Geology)
   MSU Mankato

3. **High Altitude Balloon Flight Patterns and Elastic Limitations**
   Jake Mack
   Tim Kroeger, Faculty Mentor (Department of Geology)
   Bemidji State University

4. **Particulate Emissions of Diesel Methane**
   Paul Hill
   Bruce Jones, Faculty Mentor (Department of Automotive Engineering Technology)
   MSU Mankato

1. Formula SAE Shifting

Ethan Blomquist
Bruce Jones, Faculty Mentor (Department of Automotive Engineering Technology)
MSU Mankato

The purpose of this project presented within was to research and develop a pneumatically controlled hydraulic clutch for the Formula SAE car. The problem with the shifting mechanism is that it is a hydraulically controlled clutch that requires a driver to use his hands and some of his concentration to effectively launch the vehicle. The switch to a pneumatic system would allow for a driver oriented, less complicated control system which includes launch control and would improve problems shifting when near redline. In order to achieve the goals of the project, calculations were done to solve the amount of force needed to move a hydraulic cylinder with a pneumatic one, sketches for mockup of a properly sized pneumatic piston, as well as the actual physical testing of the completed system. After testing, the system was mounted and the electronically controlled shifting system with launch control wired to the actual car. After mounting on the vehicle, the system was tested. The results are that the clutch should actuate every single time that the upshift or down shift buttons are pressed as well as being able to control a launch control system that will enable the drive to better launch the vehicle under hard acceleration. This solution will help the Formula SAE car achieve a better score in acceleration, as well as allowing the driver to focus more on the actual driving the vehicle during the races which in turn will make for faster times and better scores within the competition.

2. Silica Remobilization in the Mesabi Iron Range: Mine Ore-Waste Cutoff Prediction

Ryan Rague
Steven Losh, Faculty Mentor (Department of Geology)
MSU Mankato

Oxidation of iron formation in the Mesabi Iron Range, Minnesota, has negatively impacted recovery of the main ore mineral, magnetite, by two mechanisms. First, magnetite has been partially or completely oxidized to hematite (martite), which is not magnetically separable. Second, silica has been remobilized during the oxidation process, and comprises a higher percentage of the ore concentrate than is desirable due to its altered grain size, making it difficult to grind sufficiently. Fluid inclusion data showed that fault-channeled, diagenesis-stage fluids (mean T homog = 154° C; mean salinity = 9.5 wt% NaCl equivalent) were responsible for early oxidation of iron formation: this event is distinct from later, widespread, shallow-level supergene (lateritic) oxidation. Petrographic and SEM examination of rocks from early-oxidized zones show rims of recrystallized quartz around variably-oxidized magnetite in samples in which Fe-talc and/or minnesotaite have been oxidized to goethite, indicating silica redistribution during oxidation. No such rims have been noted in later (supergene)-oxidized iron formation, implying they may have formed only under diagenetic conditions. Additionally, fractures in magnetite grains, created by faulting, have been filled with silica, resulting in quartz micro veins that pose serious economic concerns. This study focuses on the cause and effect of silica remobilization with an eye to enabling prediction of the ore-waste cutoff in a mine from visual inspection of variably oxidized iron formation.

3. High Altitude Balloon Flight Patterns and Elastic Limitations

Jake Mack
Tim Kroeger, Faculty Mentor (Department of Geology)
Bemidji State University

The purpose of our research is to 1) develop a model to predict the flight of a high altitude balloon and 2) calculate the altitude at which the balloon will burst. An accurate prediction model will aide in balloon recovery and prevent launching the balloon at a site that will result in a poor landing location (numerous lakes, urban areas, etc.) The model will incorporate data concerning ascent rate, descent rate, and varying wind speeds. The 10 day forecast prior to launch date will be used and each day will be compared once the balloon's actual flight plan is recorded to explore accuracy. The elastic limit of the balloon will be calculated and recorded by a camera equipped on the payload. Gaseous interactions concerning pressure and temperature will be valuable when developing future high altitude balloon flight projects.

4. Particulate Emissions of Diesel Methane

Paul Hill
Bruce Jones, Faculty Mentor (Department of Automotive Engineering Technology)
MSU Mankato

Particulate emissions are created through the burning of diesel fuel in an engine and are seen as the black smoke emitted when load is applied to a diesel engine. These particulates can cause a variety of health effects, the biggest one being cancer. To reduce the amount of particulates being produced less fuel needs to be burned or combustion needs to happen more efficiently. In order to do this, methane injection has been incorporated into the test diesel engine so that it burns a mixture of both fuels. Methane burns cleaner therefore has less particulate emissions and costs much less to produce than diesel. However, diesel must be kept for idle states and to produce more torque Previous research suggests that a decrease in emissions will come with a cost to power because methane produces less power per weight. Baseline tests were performed to record particulate emissions, fuel economy, and engine power. This was done on a stock engine and with diesel fuel only; no methane was added at this time. Methane is then added in increments to record the effects on each of the previously mentioned categories. A decrease in particulate emissions with an increase in fuel economy and engine power is what the desired data would look like. Currently the research is incomplete and needs further testing to finalize the results. Conclusive data will be obtained in the next few months that may confirm previous research.

English

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1. **Characterizing Glinda as a Good Witch**
   Katelin Hansen
   Laura Fasick, Faculty Mentor (Department of English)
   MSU Moorhead

2. **A Song Telling of Ophelia**
   Julia Fong
   David Higgins, Faculty Mentor (Department of English)
   Inver Hills Community College

3. **The Great Deceiver in Milton and Tolkien**
   Maureen Kraft
   Stephen Hamrick, Faculty Mentor (Department of English)
   MSU Moorhead

4. **Disappointment and Failure**
   Debra Koenig
   David Higgins, Faculty Mentor (Department of English)
   Inver Hills Community College

1. Characterizing Glinda as a Good Witch

Katelin Hansen
Laura Fasick, Faculty Mentor (Department of English)
MSU Moorhead

The classic children's story *The Wizard of Oz* by L. Frank Baum has been retold many times, in many different mediums. This tale captured the attention of Gregory Maguire, author of The Wicked Years (a series of novels based on the life and times of the Wicked Witch of the West) and Winnie Holzman who prepared this version for Broadway production. Finally the voice of the villain is heard who gives a different perspective of Baum's classic story. In this beloved tale, the major characters from the original Wizard of Oz remain key to the telling of Maguire's and Holzman's adaptations. However, when the story is told from the perspective of the Wicked Witch, the characterization of these main characters change. One of the most influential characters in the 1939 adaptation is Glinda, the Good Witch from the North, but is she really so good? In the original version, she does not appear when Dorothy lands in Oz, but much later in the novel, but she is the beautiful witch that audiences see in the film. In Maguire's novel and on Broadway, Glinda maintains her beauty, but her brilliance and motivation are very different. The characterization of Glinda is brought into question in these adaptations. Katie Hansen compares and contrasts the characterization of Glinda, the Good Witch from four adaptations: L. Frank Baum's Wizard of Oz, the 1939 film, Gregory Maguire's Wicked, and the Broadway production of Wicked. She finds production and entertainment reasons for the character changes.

2. A Song Telling of Ophelia

Julia Fong
David Higgins, Faculty Mentor (Department of English)
Inver Hills Community College

The artistic gap my research fulfills is the inclusion of singing within a straight play as a character trait. I will need to fully understand the physical, emotional, and anatomical mechanics behind singing. My research will show that giving a character in a straight play a singing role makes them the strongest and the most vulnerable character. I will perform the study by reading books on the mechanics of singing. I will also look at critical essays to see what other peers have to say on other character traits. My significant findings include being able to understand the character Ophelia more in depth, I accomplished being able to understand why authors chose the character traits that they do. The larger implications of my findings show that it is important to look at every character trait given throughout the play and explain why the singing is so important to Ophelia.

3. The Great Deceiver in Milton and Tolkien

Maureen Kraft
Stephen Hamrick, Faculty Mentor (Department of English)
MSU Moorhead

John Milton's "Paradise Lost" and J.R.R. Tolkien's "The Silmarillion" each engage the fortunate fall and present an evil character who, through his own free will, becomes the great deceiver. These two great works of literature describe their evil characters in a similar fashion: They each choose their own will instead of the will of God, and through examining the Petrarchan conceit and apotheosis in Milton and Tolkien's works, these characters' limited agency is shown through their movement.
This presentation analyzes the similarities between Satan and Melkor, and how both Milton and Tolkien use movement to illustrate the characters' limited agency.

4. Disappointment and Failure

Debra Koenig
David Higgins, Faculty Mentor (Department of English)
Inver Hills Community College

My paper examines the psychological impact that mass-produced postwar suburbs like Levittown, New York had endured. There were negative psychological impacts during the early stages of suburbia that left families disappointed with their poorly built homes and dissatisfied with their failure to achieve certain upper-class prosperity. The society that developed in Levittown during the 1940-50's was a difficult time for many of the residing families. My research explores in how people dealt with the struggles associated with the post war era. Funds were scarce during this time and houses in Levittown were not structurally sound. After time passed by, the blissful feelings for the suburban life started to evaporate for some families. I discuss the feelings that were associated on a level of disappointment. Levittown has typically been viewed as a salvation for many people unavailable to afford homes during this time in history. However, deeper research downsizes the dark side of the suburban life. My research includes historical photos in addition to articles display unsatisfied views of an undesired emotional feeling about their lifestyle. Fathers become failures in their own minds, mothers tried to keep households together, and the children sensing the tensions that have developed. The pressures that occurred were overwhelming for those who were unhappy. They were locked into the situation of discontent. The only way to survive was to try to achieve happiness in the life that they were imprisoned in.

Language and Ethnic Studies, International Studies, American Culture, World Languages and Culture

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1. **"A lot of stuff on today is Coonery Buffoonery": Stereotypes of Black Masculinity in Modern Film**
   Zachary Toliver
   Phyllis May-Machunda, Faculty Mentor (Department of American Multicultural Studies)
   MSU Moorhead

2. **Ojibwe Grammatical Terms in Ojibwe Language Teaching**
   Jordyn Flaada
   Giniwgiizhig, Faculty Mentor (Department of Languages and Ethnic Studies)
   Bemidji State University

3. **Current Impact and Consequences of Islamic Immigration in the Country of Tolerance, the Netherlands**
   Jed Eix
   Andrew Conteh, Faculty Mentor (Department of International Studies)
   MSU Moorhead

4. **For the Right to Water and Preservation of Life: Against the Privatization of Resources in Peru**
   Kayla Abtin
   Andrew Conteh, Faculty Mentor (Department of International Studies)
   MSU Moorhead

5. **The Literature of the Latin American Dictatorships and the United States**
   Desiree Gobey
   Adriana Gordillo, Faculty Mentor (Department of World Languages and Cultures)
   MSU Mankato

1. **"A lot of stuff on today is Coonery Buffoonery": Stereotypes of Black Masculinity in Modern Film**

Zachary Toliver
Phyllis May-Machunda, Faculty Mentor (Department of American Multicultural Studies)
MSU Moorhead

While movies came into American culture as a new medium for creating stories, they also created a new dominion for recreating already popular black stereotypes. The stereotypes of African American masculinity in particular were fueled by cultural ideology. At times, these images invoked or justified violence. Although many positive images combating old stereotypes exist, those images of the black male have been, and still are, highly apparent. These stereotypes have a history of marginalizing and limiting the expectations of black men. From the early 20th century to the present, stereotypes of black masculinity in film have continued to portray black males as the violent, over-sexed buck or brute, the foolish Zip Coon, the loyal Tom, or the lazy Sambo. However, these stereotypes have also given birth to new generations of imagery, which have morphed and adapted to the surrounding modern culture. Using the methodology of content analysis, a series of films were deconstructed to better understand which sort of historic black male stereotypes still survive in film while also portraying new, modern-day typecasts.

2. **Ojibwe Grammatical Terms in Ojibwe Language Teaching**

Jordyn Flaada
Giniwgiizhig, Faculty Mentor (Department of Languages and Ethnic Studies)
Bemidji State University

While teaching and learning the Ojibwe language, we often use terms referring to grammatical concepts, such as verb, noun, animate, inanimate, transitive, and intransitive. There are currently no widely accepted and used words in Ojibwe for concepts such as these. It would be beneficial for teachers and students in both traditional language-learning classrooms and language immersion environments, as well as linguists, to be able to discuss grammar using grammatical terms in Ojibwe. Not only is the use of the English language disruptive to Ojibwe language learning, English grammatical terms are often unfamiliar and intimidating even to fluent speakers of English, which further lessens their utility as a tool for understanding the grammatical concepts of the Ojibwe language. This presentation will summarize why it would be preferable to use Ojibwe grammatical terms in Ojibwe language teaching and learning, rather than English, as well as covering the results of the work that has already been conducted with fluent speakers of Ojibwe with the goal of developing a preliminary set of Ojibwe grammatical terminology. Audience members will have the opportunity to observe and participate in short example teaching and learning dialogues using the Ojibwe grammatical terms provided.

3. Current Impact and Consequences of Islamic Immigration in the Country of Tolerance, the Netherlands

Jed Eix
Andrew Conteh, Faculty Mentor (Department of International Studies)
MSU Moorhead

The phenomenon of Islamic immigration is one of the most pressing policy issues in the Netherlands today. The Dutch have a unique situation due to their history, culture, and economic and political policies. Liberal, multiculturalist immigration laws set in place after World War II were the dominant reasons for mass immigration. While multiculturalism first appeared as forward-thinking, unintended consequences occurred, with possibility of permanent effects. Cultural tension has been high, especially since 9/11, including political murders and the rise of politicians who are against Islamic immigration. Looking at the immigration policies of the post-World War II era and the nature of Dutch culture reveals the way the issues have developed and the processes the Dutch are using to resolve them. Despite liberal Dutch culture, the nation was unable to assimilate many Muslim immigrants who came from conservative, poor backgrounds. Increased tension was also caused by migrants' intolerance of Dutch society, leading to high crime levels, disassociation with the native Dutch and a burden upon the elaborate welfare system. Recently laws have been put in place to curb Islamic immigration and public opinion on multiculturalism is negative, considered dysfunctional and ultimately a failure. Although mass migration has stopped, permanent effects may be incurred at the expense of traditional Dutch society, as demographics will soon skew more toward the Muslim population already residing in the Netherlands. Thus, Dutch values and society are in a cultural crisis that will need resolution in the near future lest it be altered permanently, for better or worse.

4. For the Right to Water and Preservation of Life: Against the Privatization of Resources in Peru

Kayla Abtin
Andrew Conteh, Faculty Mentor (Department of International Studies)
MSU Moorhead

This thesis explores whether the neoliberal theory of development is harmful or helpful to the water sources of Peru and the further expansion of water resources into poor communities. The use of neoliberal practices enhances the privatization of public resources, such as water or minerals, which in turn can lead to the restriction of resources for the general population and an increase in the rate that Peruvians will pay for their water services. Privatization of resources also may cause the pollution of water resources near private enterprises. It is through privatization that Peru has seen some improvement in its economy; however, this economic stimulus was most prevalent during the regime of Roberto Fujimori, which was the beginning of neoliberal government practices within the Peruvian government. Privatization does have some short-term benefits such as improvement of infrastructure, and alleviation of the need for government to finance all public services, but it is not a long-term solution to reducing poverty or bringing resources into poorer communities. The use of certain loans and agreements will ultimately be more beneficial to the livelihood of Peruvians in their effort to find long-term success.

5. The Literature of the Latin American Dictatorships and the United States

Desiree Gobey
Adriana Gordillo, Faculty Mentor (Department of World Languages and Cultures)
MSU Mankato

This study is important because the world is still under repressive regimes despite the spread of Democracy lately. This research has the goals to show how literature had an important role in politics of repressive regimes in Latin America. Certainly, through its denunciative character, this revolutionary literature showed that the promotion of egalitarian societies is only effective when the population cooperates freely and this is very important to know. To perform my study, I used academic sources such as documentaries, articles and books in order to understand the context at stake, as well as literary criticism that I discussed through close reading and critical analysis techniques. For example, novels and poems like Diamelia Eltit: El Padre Mio, Gionconda Belli: Hasta que seamos libres, Tomas Harris: Cipango. Based on these sources I learned that the Latin American dictatorships had an impact on the literature of this region. Among those ideas, literature presented the United States as the significant actor in these dictatorships. As a result, I concluded that the United States, via those dictatorships, did not only control this region politically but also, in doing so, lead to a revolutionary literature, which helped during this time to understand the foreign policy of the United Sates.

Biology, Chemistry and Mathematics

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1. **Insect Diversity in Southwest Minnesota**
   Ashley Edwards, Rachel Patnoe and Jessica Peterson
   E.A. Desy, Faculty Mentor (Department of Biology)
   Southwest MSU

2. **Generalized Peano Functions**
   Seth Meyer
   Damiano Fulghesu, Faculty Mentor (Department of Mathematics)
   MSU Moorhead

3. **Impacts of a Flood Pulse on Limnetic Macroinvertebrate Communities in Minnesota River Backwaters**
   Jessica Nelson
   Shannon Fisher, Faculty Mentor (Department of Biological Sciences)
   Adam Nickel, Graduate Student Mentor (Department of Biological Sciences)
   MSU Mankato

4. **Development of a Research-Like Experience For Allied Health Biochemistry Students**
   Alison Seemann
   Heather Sklenicka, Faculty Mentor (Department of Chemistry)
   Rochester Community and Technical College

1. Insect Diversity in Southwest Minnesota

Ashley Edwards, Rachel Patnoe and Jessica Peterson
E.A. Desy, Faculty Mentor (Department of Biology)
Southwest MSU

Since insects account for a majority of organisms on earth, their diversity is of importance to all science disciplines. Diversity encompasses species richness and abundance, which varies based on environmental conditions. The purpose of this study was to determine insect diversity of twenty-three Minnesota counties using the SMSU insect collections, previously collected by students and faculty from 1969-2004. We organized data by county and calculated Shannon-Wiener indices. Lyon, Carver and Redwood counties were most diverse with index values of 2.0386, 1.9969, and 1.9091 respectively. Of insects collected, 55.5% of insects were captured in Lyon County. We determined the percentages of land use for certain counties in Minnesota and compared findings with insect diversity. Insect orders Hymenoptera, Coleoptera, and Lepidoptera accounted for 61.43% of the 1177 insects collected. We concluded that Lyon County was the most diverse, which is of importance to species management and agroecosystem stability.

2. Generalized Peano Functions

Seth Meyer
Damiano Fulghesu, Faculty Mentor (Department of Mathematics)
MSU Moorhead

In this presentation we will show a family of functions in two variables whose second partial derivatives are defined everywhere in, but they are not continuous. In particular, their second partial derivatives are not commutative.

3. Impacts of a Flood Pulse on Limnetic Macroinvertebrate Communities in Minnesota River Backwaters

Jessica Nelson
Shannon Fisher, Faculty Mentor (Department of Biological Sciences)
Adam Nickel, Graduate Student Mentor (Department of Biological Sciences)
MSU Mankato

Backwater habitats change seasonally during connection events with the main channel. As a result, limnetic macroinvertebrate communities and water quality parameters may change seasonally during backwater flushing events. The objective of this study was to assess limnetic macroinvertebrate communities in three backwaters of the Minnesota River (Anderson, St. Peter, and Harris), each with differing connectivity. Sampling was conducted before (period 1), during (period 2), and after (periods 3 and 4) a flood pulse occurred in the summer of 2012. To evaluate backwater limnetic macroinvertebrate communities 10 quatrefoil light trap nights and 10 random sled net pulls (30-m each) were completed each period. Ten sled net drift samples (3 min each) were also conducted in the main channel adjacent to each backwater. Comparisons of limnetic macroinvertebrate communities between backwaters and the main channel will allow for inferences on the impacts of connectivity and water quality. A better understanding of Minnesota River backwater and main channel limnetic macroinvertebrates communities will be established, allowing for guidance on river management practices.

4. Development of a Research-Like Experience For Allied Health Biochemistry Students

Alison Seemann
Heather Sklenicka, Faculty Mentor (Department of Chemistry)
Rochester Community and Technical College

Research was undertaken to bring the study of antioxidant prevention of DNA cleavage to the undergraduate laboratory. The goal of this work is to develop a research-like experience for allied health biochemistry students to explore how antioxidants protect DNA from oxidative damage. This experience will replace up to six weeks of “cookbook” style labs. Challenges to this implementation include optimizing a known procedure for photoinduced oxidation of DNA, finding natural sources of antioxidants that limit the oxidation, staying within a tight budget, and working within the two-hour lab periods allowed to students. Before electrophoresis, the DNA is subjected to photoxidation in the presence of the photosensitizer proflavin. Gel electrophoresis shows that as the time under a light source increases, the quantity of damaged DNA increases. It was found that the DNA could be fully protected from the oxidative damage by the addition of coffee. The effects of various other antioxidant-rich foods will also be presented. When fully implemented, this lab will provide a framework for students to explore antioxidants and to better understand how research works.

Art & Design, Art, Theatre Arts

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1. **The Possibility Of Implementing Sustainable Energy Projects At Bemidji State University**
   Sanjay Maharjan
   Mahmoud AI-Odeh, Faculty Mentor (Department of Technology, Art & Design)
   Bemidji State University

2. **The Failure of St. Pierre Cathedral at Beauvais**
   Kathryn Jacobson
   Holly Silvers, Faculty Mentor (Department of Art & Design)
   MSU, Moorhead

3. **A Series of Paranoia**
   Ashton Bird
   Mika Laidlaw, Faculty Mentor (Department of Art)
   MSU Mankato

4. **Wastewater Treatment at Petrochemical Refineries**
   Charles Sandiford
   Mahmoud AI-Odeh, Faculty Mentor (Department of Technology, Art & Design)
   Bemidji State University

5. **"Othello": Cross-Disciplinary Teaching in English and Theatre**
   Maggie Olson
   David Wheeler, Faculty Mentor (Department of Theatre Arts)
   MSU Moorhead

1. The Possibility Of Implementing Sustainable Energy Projects At Bemidji State University

Sanjay Maharjan
Mahmoud AI-Odeh, Faculty Mentor (Department of Technology, Art & Design)
Bemidji State University

The research aims to find the best energy project that could save more energy, lower the costs and uplift the status of BSU on sustainability. The researchers will investigate economically the process of implementing different concepts such as LEED (Leadership in Energy and Environmental design) buildings, building retro commissioning and re-commissioning, Cogeneration plats, Biomass energy, Solar Transpired Air Heat and light on other current and future possible sustainability projects. The analyzing process will include analyzing the cost of operating current BSU energy systems, current overhead cost, cost of implementing new technologies individually, savings on energy and costs, and payback time. The research will give an overview about the viability and cost analysis for energy efficient technologies that are built / will be in Bemidji State University.

2. The Failure of St. Pierre Cathedral at Beauvais

Kathryn Jacobson
Holly Silvers, Faculty Mentor (Department of Art & Design)
MSU, Moorhead

The cause of the massive structural failure of the vaulting at the gothic cathedral of St. Pierre in Beauvais, France, has eluded architects and historians for centuries; the reason for the collapse is yet unknown. In this paper I will examine and critique Violet-le-Duc's theories behind the structural failure. I suspect his theories are incorrect. I will also explore the modern theories of architectural historians, Maury Wolfe and Robert Mark, who I believe offer the most likely scenarios for the structure's collapse. I conclude the paper by proffering that the collapse of Beauvais vaulting was because of the human error of having too many builders, architects and patrons involved in a long-term plan. This is relevant to us today because we may never understand the architectural cause of the collapse, but we can understand the social environment behind the construction of the cathedral and reveal how medieval society thought and worked. This knowledge will lead us to better understand similar works and mistakes around this time period. Further, understanding the reasons for the disastrous errors and subsequent structural failure at Beauvais should serve as a reminder to modern architects in order to prevent similar mistakes in the current era.

3. A Series of Paranoia

Ashton Bird
Mika Laidlaw, Faculty Mentor (Department of Art)
MSU Mankato

A Series of Paranoia is a series using five photos to depict the manifestation of paranoia. The photos are seen as if they were scenes in a short narrative. As the scenes progress, the delusions of paranoia control and manipulate the central figures presented in the story. Two characters are used in a staged environment to give me control of what will be seen in each photo. The characters and environment remain anonymous throughout the photos. The set used was constructed out of 8' by 4'pegboard panels attached to an

additional structure made for support. The final structure was a cubicle shape that was 8’ by 8’ by 8’. After construction, I covered the walls, ceiling and floor in water and painted white on top of the damp pegboard. This created a raw aesthetic that was fitting for my theme. The cold weather at the time further pushed the dimensions of the cubicle by warping the pegboard; this additional effect adds an element of eeriness to the environment being used. A single light was hung off centered to show the depth of the room, characters and also to dramatize the relation between the two characters in their environment. This opportunity has given me much knowledge on how to control an environment that depicts the idea I want to prove in my theme. In the future, I want to use the skills learned to create more dynamic scenarios in photographs.

4. Wastewater Treatment at Petrochemical Refineries

Charles Sandiford
Mahmoud AI-Odeh, Faculty Mentor (Department of Technology, Art & Design)
Bemidji State University

All oil refineries require water, and once used, has to be cleaned so that it can either be reused or discarded. The Environmental Protection Agency and the American Petroleum Institute dictate what is distributed back into the natural water supply. Currently, there are no profitable ways to do this and not much research is being done. In addition to looking at the processes, chemicals, and biological ways that are currently in place, we need to understand what can be done about it so that a process can be put in place or in line that is not only cost effective with current running procedures, but also that can create a new byproduct or value added process.

5. “Othello”: Cross-Disciplinary Teaching in English and Theatre

Maggie Olson
David Wheeler, Faculty Mentor (Department of Theatre Arts)
MSU Moorhead

Both English students and theater students study Shakespeare, but the information is traditionally presented with different emphases. English studies focus primarily on literary analysis and historical context while theater studies focus primarily on character development and dramatic action. As someone who has studied in both disciplines, I sought to teach the play “Othello” to a group of theater students in a way that integrated all four of these areas by combining teaching strategies from English and theater. This presentation discusses the techniques and results of this teaching approach.

Gender and Women's Studies, Anthropology

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1. **Anthropological Study of Breastfeeding and Maternal Health**
   Andrea Kochensparger
   Bruce Roberts, Faculty Mentor (Department of Anthropology)
   MSU Moorhead

2. **The Under-Representation of Minorities in Political Careers**
   Chelsea Barr and Ina Pae
   Shannon Miller, Faculty Mentor (Department of Gender and Women's Studies)
   MSU Mankato

3. **Obesity in the Independent State of Samoa**
   Matthew Doherty
   Bruce Roberts, Faculty Mentor (Department of Anthropology)
   MSU Moorhead

4. **The Disney 'Princess' Model and its Impact on Toys**
   Natasha Frank
   Shannon Miller, Faculty Mentor (Department of Gender and Women's Studies)
   MSU Mankato

1. An Anthropological Study of Breastfeeding and Maternal Health

Andrea Kochensparger
Bruce Roberts, Faculty Mentor (Department of Anthropology)
MSU Moorhead

It is widely acknowledged that maternal health and child health are two important and closely interrelated indicators of quality of life; in fact they comprise two of the eight United Nations Millennium Development Goals - MDG 4 is to reduce child mortality and MDG 5 is to improve maternal health. Adequate nutritional care of women and children is the foundation for a healthy society. Understanding early forms of nutrition is vital in fighting the deficiencies and death attributed to hunger and malnourishment. My research focuses on the works of prominent medical anthropologists in the history of breastfeeding and pregnancy. The Western world has negatively impacted many other cultures and societies, particularly when it comes to traditional birthing techniques and breastfeeding. These practices have often been denigrated and their weakening has led to a serious decline in health of women and children. In the United States, a revitalization movement around natural childbirth techniques and breastfeeding has been underway for years although it still disproportionately favors upper and middle classes. Studying changing trends in breastfeeding and pregnancy can help in initiating a revival of beneficial practices and improve the nutritional health of all women and children worldwide.

2. The Under-Representation of Minorities in Political Careers

Chelsea Barr and Ina Pae
Shannon Miller, Faculty Mentor (Department of Gender and Women's Studies)
MSU Mankato

Numerous studies have found that people of color, women, and those with physical challenges are significantly under-represented in political careers due to societal barriers. For example, women's participation in politics shows some improvement while women occupy only 12% of the political careers. To explore whether students and professors interested in political careers have experienced under-representation of minorities, a mixed-method approach with both surveys and interviews of Minnesota State University, Mankato, students and professors from the departments of Government and Gender and Women's Studies were utilized. These students were selected because both fields study political institutions, and are likely to seek political careers. Research findings support the hypothesis that minorities experience obstacles in the process of obtaining political careers. In addition, professors who work in political careers described a lack of support to maintain their career. This study has implications for raising awareness about the obstacles that people of color, women, and those with physical challenges face obtaining and maintaining political careers. Building upon a wealth of research, our findings will challenge our society to lay prejudicial barriers to rest and provide greater equality for all those seeking political careers. If accepted to both conferences, both authors will have the opportunity to represent the research as first author.

3. Obesity in the Independent State of Samoa

Matthew Doherty
Bruce Roberts, Faculty Mentor (Department of Anthropology)
MSU Moorhead

As of 2002, 85.2 percent of the population on the island of Samoa was obese. One of the reasons for the epidemic is the transition from eating traditionally prepared self-procured and produced food, to consuming low nutrient imported food. Traditional Samoans were horticulturalists who grew crops and ate whatever plants they had at hand. Freshly caught seafood, chicken and pork were the wild food, which provided protein to Samoans. Traditionally, Samoan villages were headed by a council of chiefs who distributed food and oversaw the production of crops to the families they ruled. This method of distribution worked for centuries, until the West started colonizing the area in the 19th century. Farming families started breaking up in the 1960s to focus on the urban goals of employment and education to increase economic resources. Rice is grown for food and as a cash crop in Samoa, but the traditional plant food along with chicken and pork, is still grown and raised on family plantations and served on special occasions. Health officials should examine Samoan obesity from a socio-cultural and ecological perspective by evaluating the financially challenged neighborhoods they live in and by researching the lifestyle of the average Samoan. This is needed to discover the cultural views on what needs to be changed.

4. The Disney 'Princess' Model and its Impact on Toys

Natasha Frank
Shannon Miller, Faculty Mentor (Department of Gender and Women's Studies)
MSU Mankato

The Walt Disney Company has a major impact on children's development, especially girls. Created in 2000, the Disney Princess Brand that features ten princesses, Ariel, Aurora, Belle, Cinderella, Jasmine, Mulan, Pocahontas, Rapunzel, Snow White and Tiana, has brought a whole new arena of products to Disney. Existing research examines Disney's impact on toys but has not specifically focused on the Disney Princess Brand of toys. For this research study, I conducted a visual content analysis of 275 Disney Princess toys at national retail stores, Target and Wal-Mart located in Mankato, Minnesota. I coded the primary function on the toy, the intended age range of the toy, and the Princess or Princesses featured on the toy. My results show the top uses of toys by Disney Princess are for dress up and doll play. The top Princesses featured on toys were Cinderella, Belle, and Ariel. Study findings suggest that most toys featured under the Disney Princess Brand enforce stereotypical gender roles for women such as caring for children and caring about looking like a respectable and put together woman. Toys produced under the Disney Princess Brand impact how girls are taught to be women and we, as a society, need to hold the Walt Disney Company responsible for reinforcing these norms and pressure them to change.

Political Science, Criminal Justice

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1. **California Three Strikes Law: Outside Students' Perspectives**
   Jimmy Moore
   Troy Gilbertson, Faculty Mentor (Department of Criminal Justice)
   Bemidji State University

2. **Migrant Children in the U.S. School System**
   Hannah Hanson
   Andrew Conteh, Faculty Mentor (Department of Political Science)
   MSU Moorhead

3. **Attitudes Towards Regulation of Nuclear Energy Prior To And Following Nuclear Disasters**
   Jordan Peterson
   Kara Lindaman, Faculty Mentor (Department of Political Science and Public Administration)
   Winona State University

4. **Student's Opinions and Perceptions of Their Local Law Enforcement**
   Grant Holy
   Troy Gilbertson, Faculty Mentor (Department of Criminal Justice)
   Bemidji State University

1. California Three Strikes Law: Outside Students' Perspectives

Jimmy Moore
Troy Gilbertson, Faculty Mentor (Department of Criminal Justice)
Bemidji State University

The California Three Strikes Law has been a controversial method for combating recidivism since its enactment in 1994. The strict penalties of the law include increasingly lengthy prison sentences ending with a mandatory life sentence for anyone convicted of a third felony, thus limiting offenders chances for change, and sending a “no tolerance” message to criminals statewide. The study’s sample included students attending a Midwest university and sought to gauge their opinions of the law, methods they would use to combat recidivism, and how their political preferences aligned with their opinions. A qualitative research method was adopted, and 26 students were interviewed. The findings demonstrated a desire from students to reform the California Three Strikes Law to include just serious and violent felonies, instead of any felony conviction. Along with this, many of the students' political beliefs aligned with their opinions of the California Three Strikes Law and how recidivism should be dealt with. The conclusion drawn from the sample indicates that the students typically understood and did not stray from their political party's platform, and that a similar Three Strikes Law would not be so well received among the sample.

2. Migrant Children in the U.S. School System

Hannah Hanson
Andrew Conteh, Faculty Mentor (Department of Political Science)
MSU Moorhead

Immigrant and refugee students from around the world are entering American public school systems in great numbers. They enter the United States for different reasons. These immigrants undergo different stressors and traumas that accompany the move that relates to how and why they migrated. Stressors and trauma will hinder the development of children who do not have their basic needs met. The children in these families become students who are faced with discrimination, changing family dynamics, and difficult cultural assimilation. Stressors can lead to anxiety disorders and identity crises at different times in a student's life. All of this will affect the way students learn and their capacity to learn, as well as the development of relationships with their peers and families. It is the responsibility of teachers to have a complete understanding of these students' lives and the problems they are bringing to school with them. Only then, will the teacher be able to assist such students with facing the challenges of learning in school. If used correctly, several legislative acts and programs can support these students and schools with finances and time

3. Attitudes Towards Regulation of Nuclear Energy Prior To And Following Nuclear Disasters

Jordan Peterson
Kara Lindaman, Faculty Mentor (Department of Political Science and Public Administration)
Winona State University

The attitude the public has towards nuclear energy regulations is thought to be based primarily on the perceived risk of nuclear energy. Nuclear disasters such as the incident in Japan in 2011 weigh heavily on the public conscious. My goal is to discern how much the perceived severity of a nuclear disaster changes that attitude, and in what direction. The methods used will be a questionnaire on how subjects' attitudes are towards nuclear regulations, how severe they feel the incident in Japan was, and how they think they felt prior to that. This will be compared to data on public attitude from multiple previous nuclear disasters such as Three Mile Island, a statistical analysis will be done and a trend in the shift of public attitudes will be looked for. If there is a trend, a model can be made that will predict the shift in public attitude towards nuclear energy regulation after a nuclear disaster. This would be a very useful for lobbyists, political scientists, politicians, and just about any group that becomes involved in the debate on nuclear energy. If there is not a trend, it would also indicate that more research needs to be done on the components of attitude formation for nuclear energy regulation.

4. Student's Opinions and Perceptions of Their Local Law Enforcement

Grant Holy
Troy Gilbertson, Faculty Mentor (Department of Criminal Justice)
Bemidji State University

For my Criminal Justice Senior Group Seminar we had to do a Human Subjects research study. We were able to choose any subject that was related to the Criminal Justice field. I chose to do a project on student's opinions and perceptions of their local law enforcement. I wanted to find out what students here at Bemidji State opinions and perceptions of law enforcement are and what factors go into their opinions. I interviewed twenty-two students from Bemidji State University. In my presentation I will be discussing the purpose of this study, a literature review background, my methods on how I conducted the study, the findings of the study, and finally some common themes I found throughout the study.

Philosophy, Political Science

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1. **The Demographic and Geographic Basis of Municipal Annexation in Minnesota**
   Paul Kirchoff
   Patrick Donnay, Faculty Mentor (Department of Political Science)
   Bemidji State University

2. **Amongst Defense Attorneys**
   Ashley Ramstad
   Marilea Bramer, Faculty Mentor (Department of Philosophy)
   MSU Moorhead

3. **Does Marriage Promote Inequality?**
   Jessica Hillesheim
   Marilea Bramer, Faculty Mentor (Department of Philosophy)
   MSU Moorhead

4. **Is FEMA Misunderstanding Mitigation?**
   Natasha Kleinsasser
   Patrick Donnay, Faculty Mentor (Department of Political Science)
   Bemidji State University

1. The Demographic and Geographic Basis of Municipal Annexation in Minnesota

Paul Kirchoff
Patrick Donnay, Faculty Mentor (Department of Political Science)
Bemidji State University

The growth of municipalities through sprawl and fragmentation has been an issue shadowing many cities. While there have been many studies on the models of municipal annexation, how it varies across the individual states and if there is a difference between metropolitan and non-metropolitan areas, the understanding of annexations remains uneven. This analysis takes in many demographic variables from the United States Census Bureau and 360 individual municipalities in the state of Minnesota who pursued growth through annexation since 2001. Comparing acres annexed to the economic and social characteristics of these Minnesota municipalities will provide for an interpretation of how well Minnesota cities are adapting their growth strategies to their changing demographics.

2. Morality Amongst Defense Attorneys

Ashley Ramstad
Marilea Bramer, Faculty Mentor (Department of Philosophy)
MSU Moorhead

Attorneys have faced many challenges throughout time while practicing within their field. A lot of these challenges have been addressed by ways of trial and error, placing regulations on the field, and gaining insight from other fields involving the law. However, placing regulations on the way individuals can practice or trial and error applications do not apply to the morality that is questioned across the board among the field of law and how it is practiced. More specifically, many attorneys, namely defense attorneys, have been attacked as being immoral agents while doing their exact job. It seems very hard for many individuals to believe any individual in charge of defending a guilty individual can be a moral agent. In this paper, I have set out to defend these individuals and their right to do their jobs while still being moral agents. I frame my argument with the challenges defense attorneys face when involved in such cases and how they remain true to their own moral selves. This paper will directly relate John Stuart Mill's "Greatest Happiness Principle" and Immanuel Kant's "Categorical Imperative,” proving that these defense attorneys are themselves moral agents. Although the two moral philosophies are quite different from one another, they both back up my claim and prove my thesis that individuals who are representing others who are in fact, guilty of certain crimes, are still moral individuals.

3. Does Marriage Promote Inequality?

Jessica Hillesheim
Marilea Bramer, Faculty Mentor (Department of Philosophy)
MSU Moorhead

The purpose of this paper will be to identify issues involved in the institution of marriage. I intend to research the effect marriage has on men and women. It is often reported that women work more hours and experience fewer benefits from marriage than men. So, is marriage merely an outdated institution that encourages inequality in the home? If it is the case that marriages encourage inequality, should we morally discontinue the tradition of marriage? If, as many have argued, women are less happy in marriage and experience fewer benefits, certainly it is a route we ought to consider.

4. Is FEMA Misunderstanding Mitigation?

Natasha Kleinsasser
Patrick Donnay, Faculty Mentor (Department of Political Science)
Bemidji State University

As disasters increase in their scale and scope there are continued efforts by the federal government through Federal Emergency Management Agency to try to reduce damage through efforts of mitigation. Mitigation--an often underused piece of the disaster cycle--is touted by disaster literature as a cost effective measure that has the ability to reduce the scale and scope of disasters as opposed to simply preparing with supplies, responding and recovering. There are many obstacles in managing disasters as the literature indicates which include self interest and political motivation, poorly distributed funds, and shortsightedness. FEMA has made mitigation a priority and a pivotal piece in its disaster management goals, however they face the same obstacles in disaster management as any other organization and there is an apparent disconnect between how FEMA mitigates and what the literature suggests mitigation is. Through the use of FEMA Mitigation Grant data combined with county demographics retrieved from American Community Surveys, I investigate how FEMA Mitigation Grants are distributed based on type of disaster, type of mitigation, and by county demographics and how this pattern of distribution is inconsistent with the principles of mitigation defined in the literature.

Biological Science, Chemistry, Environmental Science, Geoscience, Geography, Integrated Engineering, Manufacturing Engineering, Physics, Physics and Astronomy, Biotechnology

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   Winona State University

2. **Macrophage extracellular trap formation in response to *M. haemolytica* or its leukotoxin is altered by co-incubation with bovine herpes virus-1 infected bronchiolar epithelial cells**
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   Nicole A. Aulik, Faculty Mentor (Department of Biology)
   Winona State University
   Neelima Sennakayala and Charles Czuprynski, Faculty Mentors
   (Department of Pathobiological Sciences)
   University of Wisconsin - Madison

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   Winona State University

6. **Effects of Chemical Cues on Skeletal Ossification in Costa Rican Cichlid Embryos**
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7. **Characterization of Leukocytes Involved in Pathogenesis of Type 1 Diabetes in NOD Mice Exposed to a Persistent Organic Pollutant**
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    Brooke Burmeister
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Keith Voeller
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Abby Beltrame
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Joseph Harter, Aaron Schulzetenberg and Justin Paulsen
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Felix Meyer
Rekha Ganaganur, Faculty Mentor (Department of Biotechnology)
Minneapolis Community and Technical College

1. *Listeria monocytogenes* Produces Biofilms on Common Manufacturing Line Components

Megan Rasmussen, Holly Garding and Joy Chamberlain
Nicole Aulik, Faculty Mentor (Department of Biology)
Winona State University

Listeria monocytogenes is a Gram-positive bacterium linked to foodborne disease outbreaks in the industrialized nations. Although *L. monocytogenes* has a relatively low incidence rate, it is associated with a high mortality rate leading to an estimated 250 deaths annually in the US. Immunocompromised or pregnant individuals are at higher risk for clinical disease due to listeriosis. Listeriosis during pregnancy can lead to stillbirths and spontaneous abortions. *L. monocytogenes* produce biofilms, an elaborate community of bacteria that protect the bacterial community from desiccation and chemical disinfectants making the removal of biofilms very difficult for food producers. The most common sources of *L. monocytogenes* are contaminated ready-to-eat food items including deli meats and soft cheeses. Often food items are contaminated during processing, where *L. monocytogenes* can be isolated from various places on food processing machines such as the conveyer belts. Here, we examine the ability of *L. monocytogenes* to produce biofilms on common items found on a food processing machine. We grew *L. monocytogenes* for various amounts of time on different stainless steel, plastic and rubber parts and quantified biofilm formation by staining the biofilm with crystal violet and quantifying the crystal violet using an automated plate reader. Additionally, biofilms were also examined using scanning electron microscopy, where we could observe biofilm growth during its formation. Our data confirms that biofilms do form on common metal, plastic and rubber items found in a food processing plant. Using this knowledge, produces can develop disinfection methods to eliminate biofilm growth.

2. Macrophage extracellular trap formation in response to *M. haemolytica* or its leukotoxin is altered by co-incubation with bovine herpes virus-1 infected bronchiolar epithelial cells

Taylor Mallinger and Kristine Gerber
Nicole A. Aulik, Faculty Mentor (Department of Biology)
Winona State University
Neelima Sennakayala and Charles Czuprynski, Faculty Mentors
(Department of Pathobiological Sciences)
University of Wisconsin- Madison

Bovine respiratory disease (BRD) is the primary cause of morbidity in the U.S. beef and dairy industry. BRD is a multifactorial disease that is caused by viral and bacterial agents leading to a severe pleuropneumonia in cattle. BRD is characterized by inflammation, intense neutrophil infiltration, and recently, extensive amounts of extracellular DNA in the lungs. One possible source of the DNA is from leukocytes that release fibrillar networks of antimicrobial protein-studded DNA matrices referred to as extracellular traps (ETs). Recently, we have demonstrated that neutrophils and macrophages produce ETs in response to *Mannheimia haemolytica*, an important member of the BRD complex, and it toxin, the leukotoxin (LKT). Previous data has demonstrated that conditioned media removed from bovine herpes virus (BHV)-1 infected bovine bronchiolar epithelial (BBE) cells contain several cytokines. Here, we examined if conditioned media from BHV-1 infected BBE cells could alter ET formation from bovine leukocytes. We observed that bovine macrophages pre-incubated with conditioned media from BHV-1 infected BBE cells had a reduced ability to produce ETs when incubated with the LKT in comparison to the control macrophages pre-incubated with conditioned media from uninfected BBE cells. In contrast,

we observed that bovine macrophages treated with conditioned media demonstrated an increase in ET formation in response to intact *M. haemolytica* cells. However, conditioned media-treated bovine neutrophils were unaltered in their ET formation. Our findings suggest that BHV infection may alter macrophage production of ETs in response to *M. haemolytica* or LKT, which could alter host defense.

3. Female Neutrophils Produce Less Neutrophil Extracellular Traps in Response to the *Escherichia Coli* Hemolysin than Male Neutrophils

Leah Dols
Nicole A. Aulik, Faculty Mentor (Department of Biology)
Winona State University

Urinary tract infections (UTIs) have been estimated to cost the U.S. approximately 1.6 billion dollars in health care costs. The majority of UTIs affect women more than men where fifty to sixty percent of women will experience a UTI in their lifetime. Uropathogenic *Escherichia coli* is the leading cause of UTIs. During, a UTI there is an influx of neutrophils into the bladder, which have been demonstrated to produce neutrophil extracellular traps (NETs). NETs are composed of extracellular DNA studded with antimicrobial proteins that trap and kill various pathogens. The hypothesis of this research is that female neutrophils produce significantly less NETs in response to the *E. coli* hemolysin in comparison to male neutrophils. Human neutrophils and macrophages were isolated from whole blood taken from healthy male and female volunteers and were incubated for various times or with various concentrations of the hemolysin. Extracellular DNA was then quantified using PicoGreen. We observed a significant decrease in the amount of NETs produced by female neutrophils in response to the *E. coli* hemolysin in comparison to male neutrophils. Similarly, we observed significantly more lysis of female red blood cells as compared to male red blood cells. Preliminary results also suggest that male macrophages produce more macrophage extracellular traps
have a reduced ability to produce NETs and METs in response to the *E. coli* hemolysin, may contribute to the significant difference in the amount of UTIs women experience in comparison to men.

4. Familial Odor-Tracking by Larval Fish

Emily Mammenga, Carissa Storseth and Noah Berglund
Brian Wisenden, Faculty Mentor (Department of Biology),
MSU Moorhead

Parental care is unusual among fish, but common among fish in the cichlidae family. Convict cichlids form monogamous pair bonds and have bi-parental care of their free-swimming young for up to six weeks. During this time, parents cooperate in the defense of the young against brood predators. If the young are separated from their family they must quickly find their way back to avoid being eaten. We tested the ability of larval fish to use chemical cues to orient toward their family. Previous research showed that they could orient to chemicalcues from their home aquarium, which compromise the odors of the parents, their siblings and the gravel in the tank. In this experiment, we tested if they can orient toward the odor of an individual parent, if they can distinguish between their biological parent and an unrelated parental adult and if they can distinguish between an unrelated parental adult and an unrelated non-parental adult.

5. 20,000 mm Under the Lake: Hemoglobin Expression in *Ambystoma tigrinum*

Jorge Polanco, Elijah Velasquez, Gabriel Velez, Katelyn Magidan and Erin Gilliland
Amy M. Runck and Frances Ragsdale, Faculty Mentors (Department of Biology)
Winona State University

Differential gene expression during development is associated with growth and developmental changes. In vertebrates, members of the hemoglobin gene family are sequentially expressed during ontogeny. This hemoglobin switching has allowed vertebrates to efficiently transfer oxygen during different stages of development. The tiger salamander, *Ambystoma tigrinum*, is oviparous, starting as an externally laid egg, whereupon it develops into a larval form, and finally undergoes metamorphosis to become a terrestrial adult. However, some populations of tiger salamanders will become an adult without going through metamorphosis, thereby staying aquatic and maintaining larval features (such as external gills and finned tails). These neotenic individuals experience reduced oxygen availability than what is experienced by their terrestrial counterparts. We used RT-PCR to isolate and sequence the globin genes from mRNA and to obtain the primary hemoglobin protein structure. Q-PCR was used to quantify differential transcription levels of the globin genes in the neotenic and terrestrial adults. We characterize the blood O_2-binding affinity of terrestrial and neotenic adults using functional analyses at different levels of oxygen saturation. These results are used to understand hemoglobin switching in this species that experience different oxygen conditions during their life span.

6. Effects of Chemical Cues on Skeletal Ossification in Costa Rican Cichlid Embryos

Nicole Olson and Brittney Rother
Shireen Alemadi, Faculty Mentor (Department of Biology)
MSU Moorhead

Convict cichlids (Amatitlania nigrofasciatum) have bi-parental defense and prolonged care of their young for four to six weeks once the young are free-swimming. Convict cichlid's young rely on alarm cues that are released by damaged skin that indicate the potential presence of predators. Some aquatic animals not only use alarm cues to cue behavioral responses to predation risk, they also use these cues to alter their development to favor forms that are better able to evade predator attack. Convict cichlid eggs were exposed to one of the following treatments: (1) alarm cue with predator odor, (2) alarm cue or (3) water (control). In total, 60 eggs were treated from five different parental pairs. Then four eggs from each parental pair were assigned to each of the three cues. Eggs were treated twice a day until they hatched and were then allowed to grow 5 millimeters to 7 millimeters in length, then preserved and stained for analyzes. Pictures of the fry post-stain were used to score their skeletal ossification. We hypothesize that the eggs treated with predator alarm cue will have more ossification than the eggs treated with alarm cue and the control.

7. Characterization of Leukocytes Involved in Pathogenesis of Type 1 Diabetes in NOD Mice Exposed to a Persistent Organic Pollutant

Andrew Scott and Broc Schindler
Sarah Smits-Bandstra, Faculty Mentor (Department of Biological Sciences)
St Cloud State University

Type 1 diabetes (T1D) is a lifelong autoimmune disease caused by the attack of the body's own immune system on insulin-releasing pancreatic beta cells, resulting in insufficient insulin levels. Currently it is unknown whether the development of T1D results from genetics, the environment, or a combination of the two. Some research has suggested a possible association between environmental pollutants and T1D. Dichlorodiphenyldichloroethylene (DDE), a toxicant with many known adverse health effects, may be related to T1D development, as indicated in other research. T1D, as an autoimmune disease, is induced by cells of the immune system; therefore, if DDE affects development of T1D, it should affect populations of an exposed organism's immune cells. To test this hypothesis, non-obese diabetic (NOD) mice (the best known mouse model of T1D) and C57BL/6J mice (a secondary model organism) were injected with DDE, and leukocyte (white blood cell) subpopulations were quantified via flow cytometry. Experimental protocol consisted of cell suspension preparation from spleens extracted from DDE-injected mice, addition of fluorochrome-antibody complexes that allow the flow cytometer to detect specific cell types, and quantification and identification of leukocyte subpopulations using flow cytometry. Results were compared against a control group of mice receiving injections with no DDE. Unexpectedly, when exposed to DDE, statistically significant decreases in cytotoxic T cell populations (which attack beta cells) and increases in regulatory T cell populations (which defend beta cells by maintaining appropriate T cell populations) were observed in NOD mice. However, in C57BL/6J mice, populations of cytotoxic T cells significantly increased. Our results indicate that DDE does affect immune cell populations and might play a role in T1D development, although this association varies with species, concentration, and level of exposure.

8. Do Painted Turtles Utilize "Nursery" Sloughs?

Ashlyn Kuklock, Amie Nowacki, Angela Kooren, Chelsea Schmaltz, Emily Jorgenson, Jaclyn Kuklock, Jaime Kallstrom, Kara Nygaard, Kristin Wittman and Ryan Schmit
Donna Stockrahm, Faculty Mentor (Department of Biology)
MSU Moorhead

In a long-term study from 2001-2012, more than 800 painted turtles (Chrysemys picta bellii) were trapped alive in Clay County, Minn., to study growth rates, survival, population characteristics and movements. Captured turtles were weighed, sexed, measured, marked by scute notches (and PIT tags starting in 2006) and released on the shoreline of the slough of capture. From 2001 to 2010, we live-trapped in two sloughs approximately 1 kilometer apart and roughly 3 hectares and 6+ hectares in size. In 2009 and 2010, we noted a drastic decrease in turtle captures in our smaller slough, due to the introduction of cattle grazing around the slough in 2009. The area had previously been Conservation Reserve Program land. In 2011 and 2012, we trapped in a third tiny slough (approximately 1 hectare) halfway between the two original sloughs where cattle grazing had been excluded and the shoreline vegetation was intact. We wanted to determine if the marked turtles from the original sloughs, especially the smaller slough with surrounding cattle grazing, were moving into this undisturbed middle slough. In 2011, we were surprised to see very few captured turtles had come from the grazed slough whereas approximately three times as many turtles had come from the larger and ungrazed slough, even though a woods and hill separated this larger slough from the tiny, middle slough. The lack of vegetative cover from the cattle grazing might have been a deterrent for turtle dispersal to the middle slough. In 2011, we also noted one-third of the new turtles captured in the tiny slough were quite small, indicating this slough is perhaps a nursery slough. In 2012, the trend was again apparent. When combining data from 2011 and 2012, it appears that turtles less than 11 centimeters in carapace length in the tiny slough made up a surprisingly high proportion of the

population compared to that of the two original sloughs. Comparatively low water depths (usually 1 meter), dense cattail shoreline habitat and small size might make this third slough attractive habitat for small turtles. Increasing water levels in all sloughs in this area might also be a further factor in changing habitat use by the turtles, making some sloughs less desirable habitat. We will continue to trap in all three sloughs to further investigate this changing habitat use.

9. Antimicrobial Properties of Kombucha Ferments Against Bacteria and Yeast

Jame Lawton II
Renu Kumar, Faculty Mentor (Department of Microbiology)
Minneapolis Community and Technical College

Understanding the relationships between diet, gut micro flora, and health is an increasingly important area of research. Recent studies have demonstrated that Kombucha tea provides variable antimicrobial activity against pathogenic microbes. In this study, we tested Kombucha tea for antimicrobial activity against gram-positive bacteria, gram-negative bacteria, and yeast using an agar diffusion method. Standard zone-of-inhibition assays were used to test the hypothesis that the variance in antimicrobial activity against Saccharomyces aureus, Escherichia coli and Candida albicans is due to the varying levels of Ca2+ and Mg2+ found in different water-types (well water, artesian water, city water, type-II water and distilled water). Results indicate that high-Ca2+, -Mg2+ content water resulted in the greatest zone-of-inhibition against S. aureus, with a 22% difference when compared to distilled water (no Ca2+ or Mg2+). E. coli maintained a constant zone-of-inhibition regardless of water-type, while Candida showed little to no zone-of-inhibition. These results indicate a direct relationship exists between Kombucha prepared in high-Ca2+, -Mg2+ content water and the antibacterial activity against S. aureus, and is suggestive of further study to determine how this relationship correlates with human colonic microbiota interactions and their microbial metabolic profiles. Our results highlight the improvement of the Kombucha fermentation using different Ca2+, Mg2+ concentrations. Strong antimicrobial potentials were found, particularly against S. aureus, which may be very useful to determine alternative approaches to synthetic antimicrobial drugs. Further research is needed to understand related active compounds and their mechanisms of action.

10. The Efficacy of PIT Tag Use in Painted Turtles

Ashlyn Kuklock, Amie Nowacki, Angela Kooren, Chelsea Schmaltz, Emily Jorgenson, Jaclyn Kuklock, Jaime Kallstrom, Kara Nygaard, Kristin Wittman and Ryan Schmit
Donna Stockrahm, Faculty Mentor (Department of Biology)
MSU Moorhead

In a long-term study from 2001-2012, more than 800 painted turtles (Chrysemys picta bellii) have been trapped live in Clay County, Minn., to study growth rates, survival, population characteristics and movements. From 2001-2010, we live-trapped in two sloughs approximately 1 kilometer apart; in 2011 and 2012 respectively, we included a third slough roughly midway between the original sloughs. Turtles were weighed, sexed, measured, marked by scute notches and released on the shoreline of the slough of capture. In 2006, we began inserting PIT (Passive Integrated Transponder) tags into the abdominal cavity of all captured turtles judged to be large enough, while notching the scutes. Our purpose for the portion of the study presented here is to evaluate the use of PIT tags in painted turtles. During the seven-year period (2006-2012), we had more than 1,800 captures of 403 PIT-tagged turtles (29 were tagged in 2012). PIT tags did not seem to cause mortality or impair the turtles in any way. In fact, 16 males and 13 females

were captured during the seven-year-span and 15 additional males and 18 additional females were captured over a six-year-span. Not counting the 29 turtles tagged in 2012, 57 percent were captured during multiple years. Several turtles were captured 39 times, and tagged females were noted laying eggs in nearby habitats. We found that PIT tags were vastly superior to using only scute markings for individual ID, since scute notches were often damaged over the years and easily misread. When properly inserted, PIT-tag rejection was essentially nonexistent. The frigid Minnesota winters did not damage the tags. In summary, our data indicate PIT tags are excellent for long-term studies in painted turtles and probably other turtles as well.

11. How Intra-Clonal Density-Mediated Competition Among Rhizomes Affects the Distribution of Ramets in Three Typha Species

Joseph Bottoms and Breeanna Bateman
Bradley Cook, Faculty Mentor (Department of Biological Sciences)
MSU Mankato

Wetlands are an important ecosystem in southern Minnesota. Cattails (Typha spp.) are a common wetland species, and two of the three taxa found here are considered invasive. To better understand how these species become invasive, we sought to understand the architecture of clonal growth. Cattails reproduce clonally via rhizomes. We hypothesized that as a mechanism to reduce intra-clonal competition for resources, rhizomes would grow away from the parent plant 180° from each other. Sending clones in opposite directions of one another maximizes the space between them, reducing the degree of competition for resources. We collected 20 samples of each species (T. latifolia, T. angustifolia, T. x glauca) individually potted them in 40/70 grit silica sand, and placed them in a grid in a greenhouse. Samples were randomized weekly, fertilized bi-monthly, watered every other day, and treated with algaecide as needed. Samples were grown for 22 weeks and then harvested. We measured the angles of the rhizomes, plant height, leaf number, and biomass. We will perform an ANOVA to determine any statistical significance. Preliminary observations appear to agree with our hypothesis. Plants that successfully grew clones appear to have done so at near180° from each other. In the coming weeks we will harvest and analyze our data. Our findings will help to better understand the architecture that individual plants utilize when dispersing across the landscape. When making efforts to combat invasiveness, understanding the mechanisms with which species invade is crucial.

12. Mail Surveys to Estimate Minimum Wild Turkey (Meleagris gallopavo) Population

Ashlyn Kuklock, Jaclyn Kuklock, Amie Nowacki, Chelsea Schmaltz, Jaime Kallstrom, Kara Nygaard and Kristin Wittman
Donna Stockrahm, Faculty Mentor (Department of Biology)
MSU Moorhead

This study started in 2003 with the objective of using mail surveys to estimate the minimum wild turkey (Meleagris gallopavo) population in the Red River Valley (RRV) in the Fargo/Moorhead area. The RRV offers suitable turkey habitat in a relatively narrow corridor surrounded by a dense human population. In 2004, urban-turkey interactions were monitored as well as adding a new survey in 2005 to assess public opinion on wild turkey management options. Turkey observations reported from 2003 through 2012 show a strong population thriving in the RRV which seemed to be on a sharp increase from 2003 through 2007. The population estimate then appears to drop slightly and plateau in recent years. Public opinion in years

2010, 2011, and 2012 states that turkeys do not cause problems on their land, however problematic turkeys should be relocated, and there should be a hunting season established on the birds. This year's (2012) return rate amounted to 42.4% (84 out of 198) of surveys sent out to area observers. The opinion and observation surveys are planned to continue throughout the upcoming years.

13. Effect of DDE on Type 1 Diabetes Incidence in NOD Mouse Model

Sinduja Thinamany
Marina Cetkovic-Cvrlje, Faculty Mentor (Department of Biological Sciences)
St Cloud State University

Type 1 diabetes (T1D) is an autoimmune disorder, which results from the absence of insulin production due to the destruction of pancreatic beta cells by specific immune T cells. Genetic, environmental or even a combination of both factors could trigger the development of T1D. It is hypothesized that organic pollutants, such as p, p'-DDE, a derivative of DDT, known to be toxic to human health in general, could induce T1D. However, this has not been confirmed in previous studies. Here, we test whether long term treatment with DDE affects the development of T1D in 4 groups of an 8-week-old female Non Obese Diabetic (NOD) mouse model. This strain of mice is susceptible to spontaneous development of autoimmune insulin dependent diabetes. Each group of mice received intra peritoneal injections of either 25 or 50mg/kg DDE dissolved in dimethyl sulfoxide (DMSO), with a control group injected intra peritoneally with corn oil dissolved in DMSO, biweekly, for a period of 20 weeks. The volume injected was based on the weight of the mice. The blood glucose level was measured weekly by bleeding the tail vein and using an Accu-Chek Aviva blood glucose meter. A glycemic level of 220mg/dl or more was considered an indication of diabetes. Statistical analysis will be performed to determine whether there is a significant difference in the frequency of diabetes development and the level of blood glucose between the DDE-treated and control groups.

14. Metabolic Diversity in Bacteria Associated With Earthworm Cocoons

Jeremy Balster and Mark Walchuk
Dorothy Wrigley, Faculty Mentor (Department of Biological Sciences)
MSU Mankato

The cocoons of Eisenia fetida, a common earthworm species, contain diverse populations of symbiotic bacteria. Bacterial species are found in the surrounding soil or are passed directly from the parent earthworm to the offspring. It is important to understand the behavior of these symbionts as they are a vital component in the fitness of Eisenia fetida. To determine metabolic diversity, cocoons were selected and sterilized using ethanol. The contents were then squeezed onto individual Petri dishes containing tryptic soy agar (TSA). These plates were incubated at room temperature in microaerophilic conditions. From these plates, six organisms were selected based on colony morphology and isolated onto their own plates. Oxidase, citrate, and thioglycolate tests were performed on each of these six isolates. Of the six isolates, all but one tested positive for oxidase, and all isolates tested positive for citrate utilization. Five of the six organisms showed strictly aerobic growth, while the sixth showed facultatively anaerobic growth; this was the same organism, which was negative for oxidase. From these results, it can be concluded that diversity in metabolic behavior does exist within the simbiont population of Eisenia fetida cocoons. Further tests will be performed to reinforce these results, including gram reactions of the

organisms and nitrate tests, which will provide further information on each organism, leading eventually to a better understanding of each organism's effect on the fitness of Eisenia fetida.

15. Effect of Persistent Organic Pollutants on Proliferative Capacity of Immune Cells

Allan Lea
Marina Cetkovic-Cvrlje, Faculty Mentor (Department of Biological Sciences)
St Cloud State University

Type 1 Diabetes (T1D) is an autoimmune disorder characterized by increased blood glucose level as a result of the destruction of insulin-producing pancreatic beta cells. Beta cells are destroyed by autoreactive immune T cells. Whereas the cause of T1D still remains unknown, it is observed that T1D may be diagnosed in people who are exposed to the environmental pollutants. If so, the function of T cells, that lead the attack of pancreatic beta cells, should be affected as well. However, there are no data about direct effects of persistent organic pollutants, such as p,p'-DDE (DDE), a metabolite of DDT (commonly used pesticide worldwide for treating malaria) on immune cell function. Therefore, the focus of this project is whether, DDE affects the function of T cell population of NOD/Ltj mouse T cells. NOD/Ltj mouse is the best-described animal model for studying T1D. Here we hypothesize that DDE will affect T cell function. In order to test the hypothesis, we used spleen cells of NOD/Ltj male mice as a source of T cells. The proliferation of T cells, exposed to an agent that induces specifically T cell proliferation, was used as a measure of T cell functionality. As DDE needs to be dissolved in dimethyl sulfoxide (DMSO), and DMSO per se reduces T cell proliferation, we substantially trouble-shooted in order to find the optimal concentration of stock DDE solution that would not affect T cell proliferation, while still keeping DDE dissolved. The problem has been solved, so we are currently testing varying concentrations of DDE (from 100 to 0.013 ug/ml) added to the cultures of T cells in order to find out whether DDE affects the function of T cells.

16. Effects of Developmental Hypothyroidism on Cochlear Hair Cells in Mice

Molly Haack and Steven Piroso
David Sharlin, Faculty Mentor (Department of Biological Sciences)
MSU Mankato

Insufficient thyroid hormone during development results in deafness, but the molecular and structural defects responsible for this deafness are largely unknown. Therefore, we investigated the effects of developmental hypothyroidism on cochlear hair cells of juvenile mice. We first established three separate groups of mice: hypothyroid, control, and a hypothyroid plus thyroid hormone replacement (rescue) group. By doing so, we will be able to compare structural differences in the interior of the cochlea. We then harvested the cochlea of mouse pups on postnatal days 16 and 21. After fixing the extracted cochlea and decalcifying we exposed the apical sensory epithelium to image the stereocillia with a scanning electron microscope. We hypothesize that several structural differences between the hypothyroid and non-hypothyroid mice will be observed; including growth retardation and disorganization of hair stereocillia bundles. Disorganization of the stereocillia is associated with sensory deafness in mice and humans. Therefore, by studying these cochlear defects we will gain a better understanding of sensory deafness and the importance of sufficient thyroid hormone levels to cochlear development. Moreover, by gaining a better understanding of the structural differences between normally developing and hypothyroid mice, we will be contributing to the development of treatments aimed at eliminating cochlear defects in humans.

17. A Laboratory-based Scholarly Activity to Implement Advance Biochemistry Techniques in a 2-year A.S. Degree Program

Madeline Forbes
Rekha Ganaganur, Faculty Mentor (Department of Chemistry & Biotechnology)
Minneapolis Community and Technical College

Minneapolis Community and Technical College (MCTC) launched an A.S. Degree program in biotechnology. Biochemistry laboratory is one of the courses implemented to meet industry and academic transferability needs, requiring advance level techniques and instrumentation. The 2012 cohort set forth to try out a full-scale project involving "downstream processes" of expression, extraction, purification and characterization for a recombinant protein, to test the efficiency with which such techniques can be implemented successfully for full lab sections as the program grows. Students performed scaling-up of cultures, induced the expression of the target protein, carried out low and high resolution purification steps and characterized through SDS-PAGE, enzyme kinetic activity determination and immunoassays. The outcome of the project was successful isolation of pure protein, with enzyme activity fully retained. The biochemistry lab course is complementary to the molecular biology course in the Program, where we learn "upstream processes". While each individual student carried out the project independently, it was also a team-effort in discussing, planning the various steps, troubleshooting and assisting each other. The project also involved extensive scientific literature review, writing-intensive reports and presentation of results at MCTC's poster symposium. It helped us develop the ability to follow-through a whole project and meet the timelines to handle multiple priorities with critical thinking and problem-solving skills. The project gave us an understanding of the NIH's Recombinant DNA Advisory Committee's guidelines, requirements of biosafety regulations, and FDA's Biologics/BioPharma regulations. Good Laboratory Practices (GLP), documentation, quality control and documentation aspects were infused.

18. Intracellular Localization of Novel Polyglutamine Protein FAM171B

Seth Hintze and Brittany Stamer
Geoffrey Goellner, Faculty Mentor (Department of Biological Sciences)
MSU Mankato

Approximately 25,000 different proteins have been identified via the human genome project. FAM171B is one of those uncharacterized proteins. This protein, which is located on chromosome 2q32.1, has a polyglutamine (polyQ) stretch within its primary amino acid sequence. An expansion of this polyglutamine stretch have been implicated in various neurodegenerative diseases such as Huntington's Disease. Bioinformatics has helped us understand much more about this protein. FAM171B is likely expressed in the nervous system and contains a putative signal sequence and a single transmembrane domain. This data could suggest that the normal function of this protein is within the endomembrane system of neurons and mutations in the polyQ stretch could lead to implications in a uncharacterized nuerodegenerative disease. In this experiment we set to find out the normal cellular function of FAM171B by finding where it localizes in the cell and to assay the degree of polymorphism in it's polyQ stretch to understand the mutation potential. By using immunofluorescence we found that FAM171B displays a punctuate vesicular-like staining pattern within the cytoplasm of COS-7, HELA, and HEK cells, which is what our bioinformatics predicted. Our lab also used DNA genotyping assays to find that the polyQ tract within FAM171B is decently stable within the human population with 96.5% homogeneity. This suggests that FAM171B may not be a solid candidate for causing a neurodegenerative disease. With these initial

findings from localization and polymorphism studies, we found that FAM171B is a stable cytoplasmic proteins localizing to vesicular organelles.

19. Analysis Of Mercury Present in Fish Samples From Lake Bemidji

Elizabeth Dicker
Keith Marek, Faculty Mentor (Department of Chemistry)
Bemidji State University

The poster presentation addressing the growing concern of existence of mercury in fish. Several walleye caught in Lake Bemidji were analyzed to determine the correlation between mercury content and the weight of the fish. Mercury was extracted from the fish samples by digestion in sulfuric acid and hydrogen peroxide, followed by reduction to elemental mercury using tin(II). The quantity of mercury in the fish samples was then determined using flameless atomic absorption at 253.65 nm.

20. The Abundance and Diversity of Intestinal Parasites Collected From Blue-Winged and Ring Necked Ducks Inhabiting Lake Winnibigoshish, Minnesota

Omolayo Ogunnowo
Robert Sorensen, Faculty Mentor (Department of Biological Sciences)
MSU Mankato

The blue winged teal, Anas discors, is one of the more common ducks in North America being found in lakes, streams, and ponds. The ring-necked duck, Aythya collaris, is known mainly for habituating in freshwater ponds or lakes. At Lake Winnibigoshish, the blue winged teal and ring-necked ducks have been noted to have a record number of parasites within their respective gastrointestinal (GI) tracts. To fill the gap in our knowledge of these ducks found in Lake Winnibigoshish, this study sought to investigate the abundance and diversity of parasites residing in the respective GI systems of the ducks. The ducks utilized in this study were collected in the fall of 2012, at Lake Winnibigoshish, in northern Minnesota, as part of an undergoing large study. To manage volume of inhabiting parasites, the small intestine's of each duck was divided into 15cm segments. For this research, I obtained data containing the number of parasites in the 15cm segments of each duck. The segment in each duck observed to contain the most abundant parasites, was considered for data analysis. In order to identify and classify the parasites, they were stained with Semichon Acetic Carmine, destained with 70% alcohol, dehydrated with 100% alcohol, cleared with Xylene and mounted using Kleermount. I found that in most first segments of the ducks' GI tract, there was a vast amount of parasites that inhabited them. The hypothesis is supported, which indicates that there is an abundance and diversity of parasites inhabiting the GI tracts of the ducks.

21. Parameters Affecting Electrostatic Charge and Air Filtration Efficiency in Nonwoven Fibrous Electret Filter Media: A Scholarly Activity involving Scientific Literature Survey and Research Methodologies

Jacob Thalen
Rekha Ganaganur, Faculty Mentor (Department of Chemistry & Biotechnology)
Minneapolis Community and Technical College

Efficient air-filtration and purification have become increasingly important and widely utilized technologies for cleaner air and better health not only for daily living conditions but also in research and

industrial workplace for various end uses. Nonwoven fabrics are sheets or web structures bonded together by entangling fiber or filaments. They are very versatile, can be tailored to specific end uses and extremely suitable for reducing airborne particulate matter in a given air flow. A scholarly activity was undertaken to explore the applications of nonwoven technologies focusing on the basic mechanisms of air filtration, through scientific literature review. Mechanical filtration of particles occurs due to mechanisms of direct interception, inertial impaction, diffusion deposition, and gravitational settling whereas electrostatic filtration occurs due to Coulombic, dielectrophoretic, and inductive interactions. Variables affecting the Corona charging, a commonly employed process to create charged media was explored. Over eighty primary research articles from a variety of primary sources were reviewed. Databases such as Scopus, SciFinder, Wiley's Online Library, and Academic Search Premier were utilized. The various aspects of research learned and the writing skills provided excellent opportunity to take initiative and direct my own learning over the course of a semester. It pushed me to expand my understanding of complex topics that are not part of 2-year college science courses, and enabled analytical thinking in terms of what might improve existing techniques or overcome current obstructions in a process. The skills I developed are invaluable as I continue my scientific and engineering career.

22. Analysis of Chemical Elements in Fish Scales

Callie Sinclair and Natacha Tasha
Michael Bentley, Faculty Mentor (Department of Biological Sciences)
MSU Mankato

In Minnesota, the land of 10,000 lakes, one tends to not think about what chemical elements make up our lakes. Pollution has been a growing concern in our state. Although one may not see the effects directly, by observing other resources we can find what chemical elements are not only found in these waters but also how these elements affect other organisms. Fish scales are plates of bone that show rings with growth patterns according to seasonal cycles. With growth, the bone in the scales incorporates chemical elements. Since very little to no research has been done on fish scales, we began by researching the chemical components and morphology of these scales. To explore the scales chemical elements and morphology, we placed fish scales of different Minnesota species under an electron microscope. We then used energy dispersive spectroscopy to obtain our data needed. Our results concluded the scales chemical components are very similar to those of bone, which is what we hypothesized. We were also able to map out where the chemical elements are in relation to the morphology of the scale. Our results were very essential to be able to understand the fundamentals of a fish scale. By developing this important data, we are able to continue our research in finding potential unwanted chemical elements in fish scales, which will lead us to probable causes of pollution in our lakes.

23. Identification of Midgut Bacterial Flora of the Pitcher Plant Mosquito (Wyeomyia smithii) Larvae by 16S rRNA, recA, and gyrB Gene Sequence Analysis

Hannah Rorvick, Samuel Melchior, Zoey Armstrong and Jackie Jaspers
Tamara Mans, Faculty Mentor (*Department of Biology)*
North Hennepin Community College

The purple pitcher plant, Sarracenia purpurea L., is a mixotrophic hydrophyte native to North America bogs and fens. The modified leaves of this plant collect rainwater which captures arthropods as a supplemental source of nutrients. Although this system traps and kills a wide variety of insects for the

plant, Wyeomyia smithii, the pitcher plant mosquito, reproduces exclusively within pitcher plant fluid (phytotelmata). The bacterial community of pitcher plant phytotelmata has been extensively characterized, and continues to be studied as a model of microhabitat ecology. However, the impact of Wyeomyia smithii on the microbial flora of this environment has not been established. In an effort to better understand the relationship between the phytotelmata prokaryote flora and Wyeomyia smithii larvae, we attempted to isolate and identify the dominant, culturable bacterial species found in the midgut contents of Wyeomya smithii larvae from pitcher plants collected from a central Minnesota bog. In this study, 16S rRNA, recA, and gyrB genes were amplified from the fifteen most common midgut isolates. Amplicons from all three genes were then sequenced and compared to genomic databases for identity matches.

24. In vivo quantification of CHP-NHE1 interaction

Clarice Wallert
Joseph Provost, Faculty Mentor (Department of Chemistry)
MSU Moorhead

Calcineurin B homologous protein isoform 1(CHP1) is expressed in nearly all types of human tissues. Calcineurin B homolgous protein isoform 2 (CHP2) is primarily expressed in cancer cells. CHP1 and CHP2 are essential cofactors for the Na^+-H^+ Exchanger isoform 1 (NHE1), a key protein involved in the transformation of a normal tissue to a malignant tumor. We will use a series of lung fibroblast cells, each expressing a different level of NHE1. PSN cells over-express NHE1, while PS120 fibroblasts do not express NHE1. Thus, these two cell lines are used as positive and negative NHE1 binding controls for CHP1 and CHP2. The aim of this study was to determine the nature of CHP1 and CHP2 binding to NHE1. By transiently transfecting cells with a GFP-CHP fusion protein, we will assess and measure the location of CHP in cells with and without NHE1 expression. This work will determine how the mechanism CHP1 and CHP2 interact with NHE1 and how this interaction affects cell proliferation and migration.

25. Complete Substitution of Calcium by Lanthanum (III) in Synthetic Calcium Vanadate Apatite

Hilary Deragisch and Nicole Stenzel
Lyudmyla Stackpool, Faculty Mentor (Department of Chemistry and Geology)
MSU Mankato

Apatites form a large group of solid isomorphs with the general formula $M_5(EO4)_3X$ where M was univalent to trivalent cations (Ca, Sr, Ba, Cd, Eu, La, Na, K, and others); E was tetravalent to hexavalent cations (P, V, As, Si, Ge, S, Cr, and others); and X represented anions (OH^-, F^-, Cl^-, Br^-, I^-, and O^{-2}). Apatite compounds are widely studied due to the possibility of their use as biomaterials [1], catalysts [2], luminescent materials [3], and ionic conductors [4]. Calcium oxovanadate apatite $Ca_{10-x}La_x(VO_4)_6\square_{1-x/2}O_{1+x/2}$ modified by lanthanum is the only one whose electrical properties are described in literature. As shown in [5] oxygen vacancies make oxide-ion conductivity possible along the c axis of the hexagonal matrix. The electric conductivity of lanthanum hydroxovanadates $Ca_{5-x}La_x(VO_4)_3(OH)_{1-x}O_x$ modified by REE (rare earth elements) has not been studied yet. However, it was shown in [6] that the electrical conductivity may grow more than an order of magnitude due to heterovalent substitutions in the apatite structure. In this work we have studied the isomorphic substitution of La^{3+} for Ca^{2+} in hydroxovanadate with apatite structure under the scheme: $Ca^{2+} + OH^- \rightarrow La^{3+} + O^{2-}$ in order to refine the limits of

isomorphic substitutions which were reported earlier [7] as $0<x<0.65$. Isomorphic substitutions in system $Ca_{5-x}La_x(VO_4)_3(OH)_{1-x}O_x$, were studied by X-ray powder diffraction analysis. Samples were prepared by nitric-tartaric solutions method and calcined at final temperature of 750°C. In the system $Ca_{5-x}La_x(VO_4)_3(OH)_{1-x}O_x$ complete solubility was found ($0<x<1.0$). This result is in a good agreement with relative size factor (less than 8% for complete solid solutions). The difference in atomic radii of two ions Ca^{2+} and La^{3+} is 3.2%.

26. Development of an Integrated Learning Project for use in a Teaching Laboratory: Analysis of Alcohols, Organic Acids, and Sugars in a Fermentation Mixture utilizing HPLC and UV-detection

Jacob Thalen
Rekha Ganaganur, Faculty Mentor (Department of Chemistry & Biotechnology)
Minneapolis Community and Technical College

The primary goal of this research project is to develop a method employing high-performance liquid chromatography (HPLC) for adapting in the teaching laboratory for various chemistry courses at Minneapolis Community and Technical College (MCTC). It is intended to enable students to integrate competencies they learn from multiple courses in the A.S. degree programs in chemistry and biotechnology. The project has been undertaken towards the fulfillment of Undergraduate Research course. Quantification of key compounds of interest in a fermentation mixture by HPLC was chosen primarily because of applicability of HPLC to several courses at MCTC as well as the relevance to biofuels and food/beverage industries. While refractive index detection (RID) is commonly utilized to monitor carbohydrate, alcohol, and organic acid content in fermentation mixtures, it is an objective of this project to utilize more commonly available and cheaper UV-visible detection to quantify these analytes. In specifying the use of UV-detection for this project, an additional measure will need to be introduced in order to detect carbohydrates, which lack a UV-absorbing group in their chemical structure though derivatization. The suitability of 1-Phenyl-3-methyl-5-pyrazolone (PMP) is being explored in this regard. Derivatization of sugars will require an additional sample preparation, extraction, and filtration procedure, a fact that will need to be kept in mind during designing an adaptation of the method for student experiments. The method will also address various analytical aspects for quality control and quality assurance, which are integral components of any analytical method particularly in industry.

27. The Expression of Atir in Hypertensive Male and Female Rat Kidneys

Sonika Sainju
Theresa Salerno, Faculty Mentor (Department of Chemistry and Geology)
MSU Mankato

Hypertension is a risk factor for heart attacks and end stage kidney failure. Angiotensin II (AII) is a protein, which participates in the reabsorption of the filtered sodium from the lumen so it helps control Blood pressure. Its physiological function is mediated by binding, Angiotensin II receptor 1 (AT1R). The blocking of AT1R lowers blood pressure and its expression can be controlled at both the mRNA and protein levels. Preliminary studies suggested that the expression of a microRNA, miR-155, negatively correlates with blood pressure and could control the expression of AT1R. A Real Time Quantitative Polymerase Chain Reaction (qPCR) method was developed to measure mRNA expression of AT1R in spontaneously hypertensive (SHR) male rats versus SHR female rats. Total RNA was isolated from rat

kidney and its quality and quantity was assessed. Reverse transcription was performed to obtain cDNA from the RNA samples. The reverse primers, forward primers and probes for the targets; β-actin and AT1R were designed, and relative quantitation was measured using the ΔΔCt method. Preliminary data suggested differences in the relative expression of AT1R in the female vs. male SHR kidneys. A reverse transcription/ qPCR method was successfully developed to measure miR-155 in kidney tissues. Future work will test whether differences in miR-155 expression correlate with AT1R protein expression using the Western Blot technique.

28. Diversity of Invertebrates in a Prairie, Tree-covered and Mowed Lawn Area of the ADM-SMSU Environmental Learning Center

Diana Moe
Emily Deaver and Thomas Dilley, Faculty Mentors (Department of Environmental Science)
Southwest MSU

Terrestrial invertebrates are important because they help with decomposition, nutrient cycling, pollination, and destroying seeds. It is expected that a prairie habitat will have greater invertebrate diversity than a tree-covered or mowed lawn habitat. Nine pitfall traps 5 meters apart in 10x10m sections were placed in prairie, tree-covered and mowed lawn habitats in Marshall, MN from June 20-July 11, 2012. Traps were emptied weekly. A total of 10,113 individuals in 16 different orders were collected. Chi Square analysis indicated a significant difference between the 3 sites with Shannon Weaver density index showing higher diversity in the prairie. The prairie had mainly insects from the Hymenoptera and Coleoptera orders. The tree-covered had mostly Isopoda and Opiliones. The mowed lawn consisted mainly of Symphyplenoa. The prairie area was more diverse because it has greater plant diversity.

29. Application of Geographic Information Systems in Collegiate Football Recruiting

Matthew O'Neil
Rama Mohapatra, Faculty Mentor (Department of Geography)
MSU Mankato

College football is a major industry that is expanding rapidly. A median of 13 million dollars is spent annually on college football programs, with an average of 300,000 dollars spent on recruiting. In 2011, 1.1 million boys played football at the high school level, so the right athlete for your program may be difficult to find. Using Arc GIS, we can spatially analyze locations of where starting athletes are coming from and find patterns in their locations. The reader does not need to know anything in detail to understand this study. Using box scores and game participation, I am collecting data on who started and how many games they started in the NSIC since 2008, with the exception of two teams. After we have that data, we can map out where they played high school football and find the patterns. The preliminary findings for this research are interesting. Each school may look for a different type of athlete. Some schools may have recruited their athletes from small towns and other schools concentrate on larger schools. With ongoing research, we will see if there is a correlation between top teams and the bottom teams of the conference and where they recruit their athletes. This research will open doors for GIS and how it can be used in recruiting and assist coaches in finding athletes of their caliber.

30. Effects of Barley Extract on the Growth of Algae *Spirogyra, Synedra,* and *Ankistrodesmus*

Brooke Burmeister
Emily Deaver and Thomas Dilley, Faculty Mentors (Environmental Science Program)
Southwest MSU

Excessive amounts of algae are a nuisance in lakes. Experiments were conducted to determine the efficacy of barley straw extract in controlling algal growth in three freshwater algae. *Spirogyra* (filamentous green algae), *Synedra* (diatom), and *Ankistrodesmus* (single celled green algae) were exposed to barley straw extract in an environmental chamber for nine days. Algae was exposed in 50 mL test tubes with five replicates of each treatment, five replicates of algae with no barley extract (control) and five tubes barley with no algae. Chlorophyll concentrations were analyzed at the beginning and end of the study to determine effects on the growth of the algae. All three species of algae grew in the unexposed controls, but growth was statistically significantly reduced for all three species when exposed to barley extract (ANOVA, $p \leq 0.05$). Results indicate that barley could be used as an algistatic agent to control algae growth.

31. Implementing a Genetic Neural Network

Joseph Kolhoff
Dean Kelley, Faculty Mentor (Department of Integrated Engineering)
MSU Mankato

This paper presents my work on an implementation of an Artificial Neural Network trained with a Genetic Algorithm. The project involved initially randomly generated weights to a neural network, which were optimized via the combination of three methods, selection, crossover and mutation, in the goal of imitating genetic evolution. Experiments were done comparing random selection and fitness level probability selection in their efficiency for pairing networks through the generations. Four methods of crossover were designed and tested against each other in transferring weights efficiently. Multiple methods of mutation were created using random number generation, and these methods were tested against each other. The results of the design and trials are a close look at the effects of each method in genetic algorithms.

32. Sequence Stratigraphy of the Tyler Formation (Lower Pennsylvanian/Morrowan) in the Williston Basin, North Dakota.

Stephen Kunz and Adam Marks
Karl Leonard, Faculty Mentor (Department of Geoscience)
MSU Moorhead

This research is being done because carboniferous rocks in North America are commonly cyclical (repeating lithofacies) because of changing climate conditions resulting in sea level changes during an "Ice-house world." The Tyler Formation (Upper Carboniferous: Atokan) occurs in the Williston Basin of western North Dakota. It contains meter-scale cycles of repeating lithofacies. A sequence stratigraphic analysis improves temporal and spatial resolution, as well as provides environmental and climatic information of the cycles. The Tyler Formation has shown cyclical rock patterns repeating throughout the formation. These cycles begin with calcareous mudstones overlying a brecciated carbonate, then carbonaceous shales and inter-bedded mudstones and limestone, then capped with a brecciated carbonate

interval. Lower cycles contain fossils (inarticulate brachiopods and bivalves) that indicate shallower marine conditions, whereas middle and upper-part fossils (crinoids, brachiopods and bryozoans) indicate open-marine conditions. The lower cycles indicate a transgressing sea, whereas the middle and upper cycles represent maximum flooding surfaces. It's expected that the middle and upper Tyler cycles will show greater lateral basin extent than the lower cycles. This analysis will help with future studies of fossil distribution in the Tyler Formation and may show changing climactic conditions of the carboniferous rocks and improve the economic development of the formation.

33. Parametric Modeling of the Schlemm's Canal Using Fused Deposition

Mallory Westphal
Winston Sealy, Faculty Mentor (Department of Manufacturing Engineering Technology)
Michael Bentley, Faculty Mentor (Department of Biological Sciences)
MSU Mankato

The purpose of the research is to produce a model of Schlemm's Canal using Fused Deposition Modeling (FDM). Current research being conducted at the Mayo Clinic in conjunction with Dr. Bentley, Biology Sciences department, Minnesota State, Mankato, requires modeling the eye's Schlemm's Canal. This research is being performed to explore relationships between Glaucoma and clogging of the Schlemm's Canal. Glaucoma is an eye condition that can lead to permanent nerve damage in the eye resulting in blindness if it is untreated. Producing a model of a cross section of the eye, emphasizing the Schlemm's Canal will further aid researchers in better visualizing the effects on the Schlemm's Canal. Therefore, FDM, an additive manufacturing process will be utilized for modeling and prototyping. As a result of the layering process of FDM, a 3-Dimensional (3D) cross section model of the Schlemm's Canal will be created. Images of the Schlemm's Canal tissue generated by Microscopic Computed-Tomography (Micro-CT) will be translated into a Stereolithography (STL) file format for modeling. The STL format converts geometries into tessellated meshes. The FDM process begins by slicing the tessellated model. A thermoplastic polymer is then extruded to construct the model layer by layer. The printed model is treated to remove support and residual material. The finished model will then be inspected to determine if there are any changes or improvements that need to be made to the STL file for a better cross section model.

34. Learning to Control Our Population: The Impact of Women's Education on the Future of Sustainability

Jordan Pinneke
Stephen Lindaas, Faculty Mentor (Department of Physics)
MSU Moorhead

When thinking about the term sustainability, most people think only of related topics such as renewable energy or recycling. As important as these are to our ecosystem, the concept of an exponentially growing population and its effects on the environment is slowly becoming a more focused issue. More specifically, the high and fast-growing human population has been shown to have a correlation with the conditions of women in developing countries. Specific studies done in Tanzania; Kerala, India; and Mexico are just a few in which the fertility and education of women have been distinctively linked. There are many cultural factors that impact fertility. My report focuses mainly on the socioeconomic factor of education on the number of people in certain countries. With a greater focus on developing the education and human rights

of women, we will be better able to control the exponentially growing human population, therefore working toward a more sustainable world.

35. Applied HLA Typing: can a lab test make better transplants possible?

Kathryn Shufelt
Rekha Ganaganur, Faculty Mentor (Department of Biotechnology)
Minneapolis Community and Technical College

In order to find the best possible graft or transplant the genetic profiles of the Donor and recipient should match as closely as possible. Immunomodulation or activation of the immune system is regulated and activated by genes of the Major Histocompatibility Complex, specifically the Human Leukocyte Antigens. Molecular analysis capabilities have changed the level of resolution possible for donor/recipient (D/R) matching. Molecular methods of typing produce vast amounts of data that are being compiled into databases such as the Bone Marrow Donor Database. These databases enable meta-analysis of data gathered from D/R that will aid in finding matches, tracking selectivity trends and global distributions of alleles. Using molecular typing techniques and D/R data the construction of a reaction database to catalogue instances of antibody mediated rejection (AMR), graft versus host disease (GVHD) and similar reactions experienced by the recipient; this database could have significant implications with respect to success rates for all types of transplants. The Undergraduate Research Methods course, which this literature review was prepared for, was designed by Dr. Rekha Ganaganur (Biotechnology Faculty) at Minneapolis Community and Technical College, 1501 Hennepin Ave in Minneapolis, MN 55403. The course designation is BIOT 2722; the material covered by the course was designed to meet information literacy, communications skills and critical thinking in addition to meeting the requirements for being a writing intensive upper division course. The course provided the opportunity to become familiar with academic research strategies, methods used for finding scholarly peer reviewed resources, the writing, reviewing and ethics involved with research writing. We used the basic scientific method as a guide for the general steps for writing this review.

36. Investigation of Low Temperature Hole Mobilities in Tetracene Single Organic Crystals by Time of Flight

Keith Voeller
Russell Lidberg, Faculty Mentor (Department of Physics and Astronomy)
St Cloud State University

Organic semiconductors are rapidly becoming popular in electronic devices since they can become large and flexible. Tetracene is being investigated due to the high hole mobility. High purity tetracene single crystals were grown by sublimation and physical vapor deposition under an inert atmosphere. Samples were prepared by sputtering silver contacts on either side of the crystal. Bulk Time of Flight (TOF) measures drift velocity of charge carriers in an applied electric field across the single crystal. Charge carriers were generated by short (1 ns) nitrogen laser pulse and charge mobility can be measured from the current produced. Areas being investigated are the effects of low temperature on mobility such as any trap states or molecular packing transitions.

37. Bitter Taste Receptors and Their Genes: Do They Influence the Diet and Lifestyle Choices We Make?

Abby Beltrame
Rekha Ganaganur, Faculty Mentor (Department of Biotechnology)
Minneapolis Community and Technical College

The ability to taste bitter compounds has been well studied, and it has been found that while some individuals exhibit the ability to taste certain bitter compounds, others do not. It has been observed that individuals vary in their perceptions of the chemical phenylthiocarbamide (PTC), which is chemically similar to the substance found in Brassicca vegetables, such as broccoli and kale. The genetic basis for this observation has been attributed to single nucleotide polymorphisms in taste receptor gene TAS2R38. Questions this project intends to answer are: How does bitter taste perception influence dietary and lifestyle choices in the same group of subjects? And, are there genes other than TAS2R38 gene that influence bitter tasting ability? Methods involved include extensive primary literature research, Institutional Review Board approval, recruitment of human subjects, and procedural development and testing of the following techniques: DNA isolation and purification, Polymerase Chain Reaction, digestion by restriction enzymes, DNA analysis by agarose gel electrophoresis and gene sequencing. The polymorphisms in the taste receptor gene will then be compared to the diet and lifestyle choices questionnaire answered by the subjects. The project is anticipated to provide an insight to whether there is a genetic correlation between taste receptor genes and certain choices pertaining to diet and overall healthy lifestyles. All work carried out will be as per IRB approval.

38. Lateral Field Time-of-Flight for Determination of Surface Charge Carrier Mobility

Joseph Harter, Aaron Schulzetenberg and Justin Paulsen
Russell Lidberg, Faculty Mentor (Department of Physics and Astronomy)
St Cloud State University

The applications of organic molecular semiconductors as active elements in photovoltaics and Field Effect Transistors (FET) depend on efficient surface charge transport. Nano-scale structure and consequently charge transport characteristics are often very different at the surface, as opposed to the bulk of a material. In order to characterize the surface charge transport in organic semiconductors, a Lateral Field Time-of-Flight (LFTOF) apparatus has been designed, constructed, and applied to the study of tetracene single crystals. The surface charge carriers are excited by a pulsed nitrogen laser and are transported by an applied voltage across the crystal. A current is read by an oscilloscope and the transit time of the positive charge carriers (holes) can be measured, allowing for the determination of surface charge carrier mobility. A high mobility implies that the crystal has an efficient surface charge transport, which would prove useful for the development of organic solar cells or flexible electronics.

39. DNA Bar-coding: A Collaborative Research Project between Biotechnology Program and Urban Farm Collective Initiative, led by a PSEO biotechnology student

Felix Meyer
Rekha Ganaganur, Faculty Mentor (Department of Biotechnology)
Minneapolis Community and Technical College

DNA barcoding involves identifying species using short, standardized gene region(s). Why do we need DNA barcoding? Although there are millions of known species, there are many not yet identified. Interbreeding capabilities, morphological variations and ecological context, and genetic similarities add to the challenge of species identification using traditional taxonomy methods. Through 'DNA barcoding', it is possible to identify the origin of species or the individual source of consumer products such as meat and vegetables or to track their distribution from source to market. At MCTC we are mapping the various cultivars planted by the Urban Farm Collective group, as a collaborative learning approach. While the plants grown may look familiar and common, the cultivars vary. Barcoding will provide insight about the origins and perhaps new information. The project involves identification and documentation of specimens, sample collection, DNA extraction, "barcode" amplification and comparison with a barcode database using bioinformatics. The barcoding regions must be different for each species, ideally a single DNA locus which differs in each species, but similar enough to be amplified, aligned and compared. The chloroplast genes rbcL and matK are utilized for universal plant barcodes. This project allows implementation of various new competencies in multiple science courses and STEM workshops for high school students, to introduce biotechnology, botany and gardening hobby for healthy living, with opportunities for practical inquiry. It has proven that advance techniques can be conducted by freshmen and PSEO students. We thank the Dolan DNA Learning Center, Cold Spring Harbor Laboratories, New York.

Economics, Government

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1. **The Role of the IMF in the East Asian Debt Crisis of 1997**
   Yaro Sadek Tahirou
   Abdalla Battah, Faculty Mentor (Department of Government)
   MSU Mankato

2. **Is Sustainable Growth Possible in the Energy-rich Russian Federation?**
   Ryan Daly
   Tonya Hansen, Faculty Mentor (Department of Economics)
   MSU Moorhead

3. **The Industrial Relationships in Time-Varying Beta Cofficients in US Industries**
   Jongha Jung
   Kwang-Woo (Ken) Park, Faculty Mentor (Department of Economics)
   MSU Mankato

1. **The Role of the IMF in the East Asian Debt Crisis of 1997**

Yaro Sadek Tahirou
Abdalla Battah, Faculty Mentor (Department of Government)
MSU Mankato

During the last decades, several financial crises such as the East Asian financial Crisis of 1997, the Latin American debt crisis of 1994-95, the Russian crisis of 1998, and the Brazilian crisis of 1998-99 have occurred in the world economy. The International Monetary Funds (IMF) has been involved during these crises and known as a crisis manager. But during the East Asian Financial crisis in particular, the IMF has been criticized of promoting international cooperation because of the supervised enforcement of its rules. The purpose of this research is to find out how the IMF responded to the East Asian debt crisis, whether or not its response was the best response possible to this crisis, and what should be the future role of the IMF. To conduct this research, I analyzed 5 scholarly journals on the financial crisis in East Asia, 3 scholarly articles on the role of IMF in the East Asia financial crisis, and 1 novel called POLITICS IN SOUTHEAST ASIA DEMOCRACY OR LESS by William Case. Through my research, I talked about the causes of the East Asian financial crisis, the role of the IMF in the international monetary system, and if the IMF responses to Thailand, South Korea and Indonesia were helpful or not. After analyzing the IMF responses in this crisis, I found that the IMF policies need to be reformed in order to monitor crises spill-over effects at the global and regional levels, and prevent future financial crises.

2. **Is Sustainable Growth Possible in the Energy-rich Russian Federation?**

Ryan Daly
Tonya Hansen, Faculty Mentor (Department of Economics)
MSU Moorhead

Energy is on nearly every consumer’s mind. Energy is consumed in various forms, especially those sources that are easily accessible. Previous research (Zhang) indicates a correlation between energy consumption and economic growth within the Russian Federation. However, Zhang’s research does not consider the relationship between a country's energy production and its subsequent economic growth as recognized in the economic literature. This paper addresses the knowledge gap by quantifying energy production within the Russian Federation, and examining its contribution to the country’s gross domestic product. Public data from 2000 to 2011 are used in regression and empirical analyses to describe the growth potential of the Russian Federation as it transitions into a market-based, global economy.

3. The Industrial Relationships in Time-Varying Beta Cofficients in US Industries

Jongha Jung
Kwang-Woo (Ken) Park, Faculty Mentor (Department of Economics)
MSU Mankato

This paper examines financial linkage of systematic risks for fourthy-night US industry portfolio returns to the US general economy. Time-varying beta coefficients of Capital Asset Pricing Model (CAPM) are estimated and Granger-causality tests are carried out for identifying the significance of the industrial lead and lags to the general economic cycles measured by US industrial production index. The empirical finding shows that the strength and the causality of international financial linkage vary depending on the types of industry and the shocks in the systematic risk. Some US industries including financing industries, iron and metal industries, service, textile, real estate, shipbuilding and railroad equipment, construction materials and wearing industries are relatively vulnerable to the US general market cycles.

Gender and Women's Studies, Residential Life, Community Health

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1. **The Politics of Black Women's Hair**
   Dieynaba Niabaly and Vanessa King
   Shannon Miller, Faculty Mentor (Department of Gender and Women's Studies)
   MSU Mankato

2. **Increasing Diabetes in China and Its Impact**
   Eva McClain
   Nandita Bezbaruah, Faculty Mentor (Department of Community Health)
   MSU Moorhead

3. **Reproductive and Sexual Health Disparities Among College-Aged Black Women: An Examination on Perceptions and Consequences**
   Omolayo Ogunnowo
   Shannon Miller, Faculty Mentor (Department of Gender and Women's Studies)
   MSU Mankato

4. **Safe Zone Training: Should BSU Have One & What Should it Look Like**
   Joseph Moubry
   Randall Ludeman, Faculty Mentor (Department of Residential Life)
   Bemidji State University

1. The Politics of Black Women's Hair

Dieynaba Niabaly and Vanessa King
Shannon Miller, Faculty Mentor (Department of Gender and Women's Studies)
MSU Mankato

Historically, Black women's image has been subjected to high scrutinization that rendered every choice they made for their body and hair important. Black women have undergone many pressures that shaped their hair choices in various ways. However, there is general tendency in the literature to homogenize all Black women's experiences and disregard their ethnic diversity. In this study, we explored both African and African-American college women's feelings about the motivations to straighten (relax) or wear their hair without chemical treatment (natural). For this qualitative approach, we utilized a cross-cultural approach and interviewed 12 African and African American college women with relaxed (chemically treated) or natural (chemically untreated) to understand the motivations for their various hair choices. Findings reveal that African and African American women with relaxed hair are influenced by different factors; African women with relaxed hair reported being influenced by community and media while African American women reported family as the most influential factor regarding their hair decisions. Both African and African American women with natural hair viewed their hair as a personal choice rather than a political statement. In general, African American women reported more exposure to natural hair than African women who, for the most part, discovered it when they came to the United States. Although, Black women seem to have similar experiences about their hair cross-culturally, there are relevant particularities in each group's experiences that are worth taking into account for a more precise knowledge of these groups.

2. Increasing Diabetes in China and Its Impact

Eva McClain
Nandita Bezbaruah, Faculty Mentor (Department of Community Health)
MSU Moorhead

Chronic disease is increasing at a global level. Diabetes is one of the most prominent of these conditions. Though diabetes is becoming a worldwide epidemic, China's battle with the condition is unprecedented. More alarming than the present incidence rate, is the disease's growth pattern in China. Though the country's wealth is increasing, the economic impacts of diabetes, such as cost of medications and medical complications, are crushing. Social and cultural heritage are being lost within the country's evolution. This paper discusses why these changes are occurring and how it is affecting the people and their future. Peer-reviewed articles and studies were used for data and as sources of background information. Research revealed that China's diabetes growth rate is largely due to cultural changes that have increased disease risk factors. There has been a shift from traditional Chinese lifestyle to that of an industrialized hub that feeds into the global economy. Condensed cities and urban job markets have caused increases in fresh food prices and made convenience foods more available, significantly driving up the number of people eating processed foods. Sadly, this has the most effect on lower income brackets because processed foods are more affordable. Industrial work environments also decrease activity levels, and sedentary lifestyle is one of the greatest risk factors for diabetes. As a result of the information gathered, key interventions are proposed that drive at the heart of the problem's cause.

3. **Reproductive and Sexual Health Disparities Among College-Aged Black Women: An Examination on Perceptions and Consequences**
Omolayo Ogunnowo
Shannon Miller, Faculty Mentor (Department of Gender and Women's Studies)
MSU Mankato

Health disparities are a form of healthcare marginalization that exists currently in the United States healthcare system. Women's health continues to gain attention; however, gender and racial marginalized black women continue to struggle to gain access to or utilize healthcare resources. Black women have been noted to have increased diagnosis of reproductive and sexual health diseases. College-aged black women may be at greater risk for poor health outcomes than other populations of black women because they are often busy with their education and may lose discernment of the importance of health. This research study examined the perceptions and consequences of health disparities amongst black women attending Minnesota State University, Mankato. Surveys questions obtained information on how college-aged black women perceived reproductive and sexual health as well as possible factors that may be influencing health disparities among them. A total of 75 responses were collected. Research findings reveal that most respondents have very little to no knowledge regarding reproductive health. This lack of perception leads to a detrimental consequence, thus contributing to health disparities. The implication, accordingly, is to push for more aggressive campaigns on the availability and utilization of healthcare resources, particularly for college-aged black women.

4. **Safe Zone Training: Should BSU Have One & What Should it Look Like**
Joseph Moubry
Randall Ludeman, Faculty Mentor (Department of Residential Life)
Bemidji State University

This presentation examines possible content that could be included in a Safe Zone training, specifically a Safe Zone training manual, for Bemidji State University. This was examined through looking at what other colleges and universities had in their Safe Zone training programs/manuals and whether these could match the needs of Bemidji State University.

History

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1. **The Media's Darkest Hour: How Propaganda Killed Millions in World War II**
   Kevin Riemenschneider
   Tom Williford, Faculty Mentor (Department of History)
   Southwest MSU

2. **Bringing the Trash Back In**
   Jimmy Clinton
   Heather Hawkins, Faculty Mentor (Department of History)
   Winona State University

3. **The Disappearing Women of Juarez and Chihuahua, Mexico: Femicide, and the Struggle For Women's Rights**
   LaShae Lambert
   Marlene Medrano, Faculty Mentor (Department of History)
   MSU Mankato

4. **Emmeline Pankhurst and the Women's Social and Political Union: Scholarly Interpretations through the Ages**
   Emily Schoephoerster
   Tom Williford, Faculty Mentor (Department of History)
   Southwest MSU

1. The Media's Darkest Hour: How Propaganda Killed Millions in World War II

Kevin Riemenschneider
Tom Williford, Faculty Mentor (Department of History)
Southwest MSU

During World War II, governments produced social propaganda in order to demonize their enemy. Several ethnicities were dishonored, ridiculed, and humiliated in the hopes of strengthening one's own nation. Government ministries introduced new forms of propaganda, which frequently relied on racist elements. Racism has been and continues to be a powerful tool for encouraging and inspiring war. During World War II this idea led to the massacre of millions of lives, as well as heinous acts carried out by the soldiers who fell victim to the psychological effects that their own government pushed on them.

2. Bringing the Trash Back In

Jimmy Clinton
Heather Hawkins, Faculty Mentor (Department of History)
Winona State University

The 1978 Supreme Court decision in *City of Philadelphia v. New Jersey* had far reaching implications for environmental protection measures, and warrants historical attention. *City of Philadelphia* fits into the narrative of the Second American Environmental Movement given that it happened in the late 1970s when enthusiasm for environmental protectionism was fading but prior to the rise of the New Right in the 1980s. The goal of this project is to place *City of Philadelphia* into historical context and to demonstrate its importance in American legal history, largely through its notable and influential dictum. The 7-2 decision struck down a New Jersey statute that outlawed bringing trash generated out of state into New Jersey. The cities of Philadelphia and New York filed the suit since both relied on exporting trash to New Jersey. This case appears to be a straightforward 'states rights' case, with the Supreme Court following precedent and removing obstructions from commerce 'between the states'. There is a dictum within the opinion, however, that holds immense importance. This dictum states that both economic and environmental protectionist measures should be treated identically before the law, thus subjecting environmental protection to the same legal hurdles as economic protectionist measures. My paper argues that *City of Philadelphia* not only fits into the historical narrative of the Second American Environmental Movement, but represents a critical moment in environmental legal history: when the Supreme Court decreed that environmental conservationist measures and economic protectionist measures were no different in the eyes of the law.

3. The Disappearing Women of Juarez and Chihuahua, Mexico: Femicide, and the Struggle For Women's Rights

LaShae Lambert
Marlene Medrano, Faculty Mentor (Department of History)
MSU Mankato

In the past twenty years over 400 women in Juarez and Chihuahua Mexico have been murdered, and a countless number missing. These women were raped, beaten and then tossed on the side of the road, or in mass graves. The bodies were at times dismembered and or unrecognizable. I will argue that the Mexican government has failed to adequately investigate these crimes, and bring justice to the families of these women. Many organizations have been formed by family members of these victims and have brought national attention to the human rights violations that are taking place in Mexico. I have consulted the Historical Abstracts database to gather research about the prevalence of femicide in Mexico. In addition the documentary Missing Young Women, the NACLA Report On the Americas journal, CIP Americas online archives, and several books used as secondary sources, have all supported my argument. Government documents have revealed that laws that have been put into place to protect women, but legislation has not been enforced by the local police or military officials. The way in which the organized groups searching for their family members are treated has been an appalling discovery. Sometimes these individuals go missing themselves for bringing too much attention to the disappearances and murders. The Mexican government is taking extreme measures to allow these murders to continue without holding anyone accountable. The families of the victims will not give up until femicide in Mexico is put to an end.

4. Emmeline Pankhurst and the Women's Social and Political Union: Scholarly Interpretations through the Ages

Emily Schoephoerster
Tom Williford, Faculty Mentor (Department of History)
Southwest MSU

Emmeline Pankhurst was a controversial and influential figure in the British women's suffrage movement during the early 1900's and founded the militant suffrage group the Women's Social and Political Union (WSPU). Throughout the years, academics have expressed different opinions about Emmeline Pankhurst, the Women's Social and Political Union, the usefulness of their militant tactics and whether the suffragettes helped or harmed the women's enfranchisement cause. This study examines how historians, scholars and academics have treated the topics of Emmeline Pankhurst and the WSPU from the 1930s to today.

Education, Management

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1. **The Effects of Grief on Students and What School Administrators Are Doing To Help Students Cope and Succeed**
   Betty Richardson
   Kristine Snyder, Faculty Mentor (Department of Education)
   Minneapolis Community and Technical College

2. **The Impacts and Results of Online Presence for Small Business**
   Emily Schmitt
   Queen Booker, Faculty Mentor (Department of Management)
   MSU Mankato

3. **Mentoring Relationships: The Impact of Formal Mentoring on Career Enhancement and Leadership Development**
   Mai Yang
   Mauvalyn Bowen, Faculty Mentor (Department of Management)
   Metropolitan State University

1. **The Effects of Grief on Students and What School Administrators Are Doing To Help Students Cope and Succeed**

Betty Richardson
Kristine Snyder, Faculty Mentor (Department of Education)
Minneapolis Community and Technical College

According to the CIA World Handbook approximately 155,000 people die every day. Attached to every one of these 155,000 people there are brothers, sisters, mothers, fathers, grandparents, extended families, friends and acquaintances. In this research study I will show you different reactions and coping skills of individual students in different learning environments who have dealt with different levels of grief. You will also find what kinds of support services are offered to students in different grade levels who are dealing with the loss of a loved one and are attending urban public schools as opposed to rural, private, or charter schools in Minneapolis and surrounding communities. You will find interviews of school social workers, administrators, school councilors as well as teachers and students. My interviews contain different student's reactions to grief and the effect it has on both their intellectual and social learning.

2. **The Impacts and Results of Online Presence for Small Business**

Emily Schmitt
Queen Booker, Faculty Mentor (Department of Management)
MSU Mankato

During the years 2006 to 2010, small businesses looked for areas to gain a competitive advantage in a recession era. Some attempted to create an online presence for themselves through the use of a website or social media network. Primary research from one of my previous studies of the 2006-2010 period revealed that small businesses that had a website were 14 percent more likely to be profitable than those that didn't. In the age of the "user", prospect customers that only view a product or service online before going to the store, having an online presence is the only way to reach that target group. Other reasons to have an online presence include more accessibility, a greater audience, brand building, reviews, and overall easier marketing. This research project examines whether having website presence impacted profitability for three geographically, economically and ethnically different areas in the United States. The significance of this research is to determine if an online presence increased the probability of profitability for small businesses during the United States economic recession and subsequent recovery. The primary research methodology is observational research using convenience sample data from three regional small business development centers. The centers supplied data regarding number of employees, industry type, website presence, and net revenue from 2007-2010 for a 433 small businesses. Binary regression will be used to determine factors influencing profitability. I expect outcomes to show that companies with an online presence were significantly more likely to be profitable than companies that did not use any online resources.

3. Mentoring Relationships: The Impact of Formal Mentoring on Career Enhancement and Leadership Development

Mai Yang
Mauvalyn Bowen, Faculty Mentor (Department of Management)
Metropolitan State University

Mentoring has been the focus of much research and discussion over the past decade (Ragins, Cotton & Miller, 2000). Significant advances have been made in understanding the nature, process, and outcomes of mentoring relationships. According to Hezlett & Gibson (2005), literature on mentoring is still evolving and there are still many questions to be answered about mentoring and the benefits it accrue to protégés. Many organizations have attempted to duplicate the benefits of informal mentoring by developing formal mentoring programs. Formal mentoring relationships develop with organizational assistance or intervention, usually in the form of matching mentors and protégés. The nature of the relationship between the mentor and mentee is aimed at career, leadership, and personal development. Relationship examples include: exploring career interests and options, improving personal communication, enhancing leadership abilities and fostering self-confidence. Despite this popularity, little is known about the effect of formal mentoring programs on career enhancements and leadership development. Hence, the purpose of this article is to examine the impact of the quality of mentoring relationships through past research and practice on mentoring as to identify gaps about mentoring that are relevant to career enhancement and leadership development. After reviewing fundamental aspects of mentoring relationships, the authors summarize critical issues that have been studied regarding mentoring, proposing new directions for mentoring programs and implications for future research. The authors conclude with a research agenda to better inform programs and practice of mentoring while identifying the extent to which formal mentoring relationships impact career enhancement and leadership development.

English, Communication, Writing and Arts

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1. **Poetry**
   Rebecca Lux
   Edward Bok Lee, Faculty Mentor (Department of Communication, Writing, and the Arts)
   Metropolitan State University

2. **Poetry**
   Xander Bilyk
   Edward Bok Lee, Faculty Mentor (Department of Communication, Writing and the Arts)
   Metropolitan State University

3. **Hamlet, More Than a Dynamic Character**
   Michael Peterson
   David Higgins, Faculty Mentor (Department of English)
   Inver Hills Community College

4. **Henry IV and the Politics of Shakespeare's Day**
   Zelphia Peterson
   David Higgins, Faculty Mentor (Department of English)
   Inver Hills Community College

1. Poetry

Rebecca Lux
Edward Bok Lee, Faculty Mentor (Department of Communication, Writing, and the Arts)
Metropolitan State University

The author will present original self-selected poetry.

2. Poetry

Xander Bilyk
Edward Bok Lee, Faculty Mentor (Department of Communication, Writing and the Arts)
Metropolitan State University

The author will present original self-selected poetry.

3. Hamlet, More Than a Dynamic Character

Michael Peterson
David Higgins, Faculty Mentor (Department of English)
Inver Hills Community College

My paper/speech is about how Hamlet, from Shakespeare's “Hamlet”, is a character that is more complex and compound than an average dynamic character. My points are that he develops other characters around him, and has a character that is not solidly defined as other characters in the play reveal things about Hamlet rather than Hamlet revealing things about himself. My conclusions come from closely studying Hamlet and scrutinizing the nuances in his character. I find my work practical in that it details a very complex character in a famous piece of literature. Before my reader can fully appreciate my work, they should have read Hamlet by Shakespeare. I learned and found great examples of how Hamlet is a special character in the sense that what the audience may perceive about him may not be necessarily true about him. Shakespeare filled his writings with much information, concisely fitted in highly entertaining works.

4. Henry IV and the Politics of Shakespeare’s Day

Zelphia Peterson
David Higgins, Faculty Mentor (Department of English)
Inver Hills Community College

Understanding Shakespeare’s work from a modern perspective can sometimes be a bit challenging. As modern readers, we lack some of the crucial historical understanding that is essential for a proper understanding of Shakespeare’s plays. I am attempting to learn how to better understand the nuances in Shakespeare’s work by doing research to better understand the contemporary influences historical events and politics had on Shakespeare’s writing. My research focuses on the impact that renaissance politics such as the changing notion of power and the crumbling influence of the Catholic church had on the writing of the play King Henry IV Part I. I intend to examine how the political tensions of Shakespeare’s day are reflected in his work. As part of the research, I will be researching original period, first-person documents for historical context, the text of Henry IV for the writing style, and various modern critical analyses for perspective. I anticipate being able to demonstrate parallels between the tensions and issues explored in the play and the tension from the politics of Shakespeare’s day. The result will be and original research paper 8-12 pages in length, with an accompanying oral presentation that attempts to understand at a historical, theatrical, and personal level the intricacies of King Henry IV Part I.

Physics and Astronomy, Physics, Environmental Science

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1. A Photometry of the Young Cluster Berkley 87
Abolaji Akinyemi
Paul Eskridge, Faculty Mentor (Department of Physics and Astronomy)
MSU Mankato

2. Pinpointing the Period of EY Uma
Hollee Johnson
Matthew Craig, Faculty Mentor (Department of Physics)
MSU Moorhead

3. Target Development to Optimize 13N Extraction from Graphite
Lucas Swanson, Udit Kapur, Nathan Gretz, and James Faraday
Andrew Roberts, Faculty Mentor (Department of Physics and Astronomy)
MSU Mankato

4. *Staphylococci* Occurrence and Resistance to Antibiotics on the Southwest Minnesota State University Campus
Rachel Graupmann
Emily Deaver and Thomas Dilley, Faculty Mentors (Department of Environmental Science)
Southwest MSU

1. A Photometry of the Young Cluster Berkley 87

Abolaji Akinyemi
Paul Eskridge, Faculty Mentor (Department of Physics and Astronomy)
MSU Mankato

We obtained images of a field in the star cluster Berkeley 87 through a set of filters that extend from the near ultraviolet to the near infrared. The Images are taken in the U band (wavelength ~ 360nm), B band (~420nm), V band (~520nm), R band (~640nm), and I band (~800nm). From these images, we measured the brightness of ~ 180 stars in the cluster. Such measurement is called photometry. The photometry of our images is then calibrated using published photometry of a subset of the stars in our field of view. The calibrated photometry is presented in a set of Color-Magnitude, and Color-Color diagrams. The magnitude system is an inverse logarithmic scale that ranks stars in order of brightness. The difference in the magnitude of the star in two different band passes gives the color of the star. As a result, colors are logarithms of flux ratios. The Color-Magnitude diagrams of the cluster are constructed using the measured magnitudes of the stars in the cluster. The Color –Magnitude and Color-Color diagram are used to derive estimates for the distance, age, and foreground reddening of our cluster target. Studies of Berkeley 87 tell us about recent star formation as it is a very young cluster (a few million years old).

2. Pinpointing the Period of EY Uma

Hollee Johnson
Matthew Craig, Faculty Mentor (Department of Physics)
MSU Moorhead

The period of the presumed variable star EY Uma has until now not been listed in any available literature. Observations were taken of the star during the course of eight months and data was reduced using AstroImage. Changes in magnitude were found using ensemble photometry with seven check stars in the field, and the results were analyzed using a Lomb-Scargle algorithm to create a periodogram. Candidate periods were tested and narrowed down to the current measured period of 0.54905 +/- 0.00005 days, and this period was used to create a phased light curve for EY Uma.

3. Target Development to Optimize 13N Extraction from Graphite

Lucas Swanson, Udit Kapur, Nathan Gretz, and James Faraday
Andrew Roberts, Faculty Mentor (Department of Physics and Astronomy)
MSU Mankato

A target system has been developed for producing and extracting 13N (t1/2 ~10 minutes) using the 400 keV Van de Graaff accelerator in the Minnesota State University Applied Nuclear Science Lab in Mankato. Radiolabeled 13N compounds are commonly used for physiological imaging using Positron Emission Tomography (PET), a quantitative nuclear technique. 13N is produced in the 12C(d,n)13N reaction by irradiating our custom graphite target with a 400 keV deuteron beam.. The carbon target is then heated by an electric current to release the nitrogen isotope while simultaneously passing a suitable reaction gas though the target apparatus to extract the 13N from the carbon matrix. Our research this year has aimed to discover the impact that the deposition depth has on the extraction of the 13N. The proposed method to accomplish this was to change the angle of beam incidence. Although the amount produced is insufficient for imaging work, the theory and procedure may be applied at higher energy laboratories, capable of a greater yield reaction such as 13C(p,n)13N.

4. *Staphylococci* Occurrence and Resistance to Antibiotics on the Southwest Minnesota State University Campus

Rachel Graupmann
Emily Deaver and Thomas Dilley, Faculty Mentors (Department of Environmental Science)
Southwest MSU

Staphylococcus aureus is a potentially harmful human pathogen to weakened immune systems, and has become more resistant to antibiotics. Objects such as soap dispensers, doors, drinking fountains, hand railings, and computer keys, in ten SMSU buildings were swabbed to determine the density of *Staphylococcus* present on July 24th, August 31st, and September 10th of 2012. Percent of *S. aureus* showing antibiotic resistance to 6 antibiotics (Cefoxitin, Doxycycline, Oxacillin, Erythromycin, Vancomycin and Rifampin) was determined. Density of *Staphylococcus* increased as the concentration of students and faculty increased. Objects with the greatest amount of skin contact had the highest counts, such as the computer keys in the CH building. Resistance testing showed *S. aureus* had a remarkably high percent of resistance to the antibiotic Erythromycin at 23.44%. The percent of *S. aureus* resistant to the other five antibiotics was less than 8% resulting in a low health concern on the SMSU campus.

Education, Communication, Writing, and the Arts

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1. **Successful African American Males**
   Charlena Davis
   Kristine Snyder, Faculty Mentor (Department of Education)
   Minneapolis Community and Technical College

2. **Big Foot: The Overwhelming Footprint of Pearson Publishing**
   Carole Braschayko
   Steven Grineski, Faculty Mentor (Department of Education)
   MSU Moorhead

3. **"Urban" and "Suburban" Schools**
   Brian Nelson
   Kristine Snyder, Faculty Mentor (Department of Education)
   Minneapolis Community and Technical College

4. **Afternoon Sessions**
   Pearl Madryga
   Edward Bok Lee, Faculty Mentor (Department of Communication, Writing, and the Arts)
   Metropolitan State University

1. **Successful African American Males**
   Charlena Davis
   Kristine Snyder, Faculty Mentor (Department of Education)
   Minneapolis Community and Technical College

What does it takes to be a "successful" African American boy in an urban context? What can we learn from African American boys who self identify as "successful?" In this qualitative research study, I will explore themes that challenge traditional definitions of success and uncover practices educators might adopt to support African American boys. This research project will discuss the perception of what black males perceive as quality education and how self perception is impacted by race, gender, socioeconomic status, and family structure. The voices and ideas of the boys will lead the research and will be honored as experts.

2. **Big Foot: The Overwhelming Footprint of Pearson Publishing**
   Carole Braschayko
   Steven Grineski, Faculty Mentor (Department of Education)
   MSU Moorhead

Corporate school reform certainly affects what goes on in P-12 schools as well as teacher education. Corporations like Pearson Publishing and foundations like the Bill and Melinda Gates Foundation are not only transforming the work of teachers and teacher educators, but sadly also transforming the very purpose of their work. As a result, with my mentor Steve Grineski, I decided to examine this powerful influence that permeates all aspects of our work at Minnesota State University Moorhead. We began reading various materials analyzing corporate school reform and Pearson Publishing, in addition to Pearson Publishing's own web-based materials. Next, we generated categories of interest; for example, I picked Pearson Publishing's Teaching Performance Analysis (TPA) effect on student teachers; and Steve was interested in better understanding effects of corporate school reform. Throughout the semester, we met and talked about what we had learned and what questions emerged. We developed a paper that we submitted for publication to share our thoughts. I hope that with this research, we can heighten awareness about corporate school reform to bring about positive change.

3. "Urban" and "Suburban" Schools

Brian Nelson
Kristine Snyder, Faculty Mentor (Department of Education)
Minneapolis Community and Technical College

If two schools are only eight miles apart, how different can you expect the classroom learning to be? In this research project, I will be questioning what if any tensions are between an "urban" second grade classroom and a "suburban" second grade classroom. Using an ethnographic case study method of a "urban" and "suburban" elementary schools, I will layer the narratives that emerge by specifically focusing on the social learning and behavioral environments. Although the research is ongoing, preliminary themes have come forward such as varying themes of curriculum, teacher expectations, and teachers' guidance practices may possibly attribute to the differences. How these themes emerge and societal assumptions can also contribute to the students' performance in the two classrooms, and even play a role in the governance implied in schools. Audience members will leave this presentation with new information and new data for further discussion of assumed alignments between "urban" and "suburban" school settings.

4. Afternoon Sessions

Pearl Madryga
Edward Bok Lee, Faculty Mentor (Department of Communication, Writing, and the Arts)
Metropolitan State University

Creative nonfiction poetry piece about young girls I teach after school in south Minneapolis. Themes of identity and struggle.

Elementary Education, English

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1. **The Grave Yard Exposure of Hamlet's Soul**
   Luke Zenker
   David Higgins, Faculty Mentor (Department of English)
   Inver Hills Community College

2. **School Violence in Russia Federation**
   Olga Pestereva
   Elizabeth Sandell, Faculty Mentor (Department of Elementary and Early Childhood)
   MSU Mankato

3. **Comparison of Inter-Cultural Competency Between American and Russian Undergraduate Students**
   Elizabeth Lohrenz, Olga Pestereva, and Audrey Kalugin
   Elizabeth Sandell, Faculty Mentor (Department of Elementary and Early Childhood Education)
   MSU Mankato

4. **"Rosamede" and Gender Perception**
   Mariah Schumacher
   David Higgins, Faculty Mentor (Department of English)
   Inver Hills Community College

1. The Grave Yard Exposure of Hamlet's Soul

Luke Zenker
David Higgins, Faculty Mentor (Department of English)
Inver Hills Community College

I am in the process of producing a research paper about the profound uniqueness of Hamlet's character and journey being illustrated at full blossom in the graveyard scene. I fervently believe the graveyard scene is the platform Shakespeare created for the purpose of unveiling Hamlet's motives. I have identified these motives as three essential tenants intertwined in a complicated way: fear of death, shown apparent just by the fact he ends up in a graveyard, of all places; his emotional life, enshrouded by feelings of love for the mysterious Ophelia; and thirdly, his role as Prince putting him in a political position wherein he has to balance the vested interests of the state with the Christian code, his family's honor, etc. These motives are all the more clear when he proclaims what the skull of Yorrick means to him, when he reflects on the same mortality kings of old must bear as anyone else, and when he jumps into the grave in lamentation over the deceased, suicide-driven Ophelia. To make these points all the more vivid, I will lead you into a thoughtful, educated, researched dialogue considering the entirety of the graveyard environment; the skulls, the dirt, the dead, Ophelia, and the gravediggers (as motifs). These cooperating elements represent an omen of impending doom along Hamlet's meandering path back to the court to face his fears, setting the stage to explore juicy topics about the world, a hero's journey, the profundity of the story itself, and humanity as a whole.

2. School Violence in Russia Federation

Olga Pestereva
Elizabeth Sandell, Faculty Mentor (Department of Elementary and Early Childhood)
MSU Mankato

The problem of violence and aggression within the schools has attracted the attention of North Americans for many years. However, recent reports appear to indicate that such violence is even more prevalent and severe than in the past. An analysis of psychological and pedagogical literature showed that school bullying is considered in the modern world as a serious social and pedagogical problem. Violence at school includes bullying, physical or psychological terror, aiming to cause another fear and thereby control [Kon, 2006]. Ozhieva [2013] has divided school violence into physical school bullying (intentional kicks, punches, blows and other bodily injuries, etc.) and psychological school bullying (related violence, effect on the psyche, and psychological trauma). The consequences of violence in school, according to Pronina [2008] include: (1) loss of self-esteem and feeling intimidated; (2) neurotic disorders, depression, disturbance of sleep and appetite; and (3) thoughts about suicide. Despite the serious consequences of bullying, the scientific literature and research in Russia has focused very little on school-based violence in Russia. This research will report on a survey of recent graduates of School Number 29, Magadan, Russia. Results indicated that local students were very aggressive towards each other, and rated high on scales of verbal aggression, physical aggression, and negativism. Data analysis revealed that adolescents often have to deal with violence directed toward self and directed towards other people. Almost all respondents expressed their understanding that violence is unacceptable and causes negative consequences. However, the teenagers reported that they felt unprotected and unsure where to seek help.

3. Comparison of Inter-Cultural Competency Between American and Russian Undergraduate Students

Elizabeth Lohrenz, Olga Pestereva, and Audrey Kalugin
Elizabeth Sandell, Faculty Mentor (Department of Elementary and Early Childhood Education)
MSU Mankato

The purpose of this study was to compare the American undergraduate students' cultural competency to that of Russian university students. The analysis of the cultural competency of Russian students acted as a comparison variable in the continued research of cultural competency in the classroom among American undergraduate university students. This research was based on the Developmental Model of Intercultural Sensitivity, developed by Bennett (1986). The DMIS described six stages of cultural competence: (a) Denial or Unaware; (b) Polarization or Defense; (c) Minimization; (d) Acceptance; (e) Adaptation; and (f) Integration. Based on the DMIS, Hammer and Bennett (1998, 2001) developed the Intercultural Development Inventory (IDI). Subjects for this study included 26 persons, 18 to 30 years old, who were enrolled in the North-Eastern State University, Magadan, and 26 persons, 18 to 30 years old, who were enrolled in Minnesota State University, Mankato. This study assessed cultural competency with the IDI (Hammer & Bennett, 1998, 2001). The IDI consisted of fifty, Likert-type items that can be answered in 20 to 30 minutes. All students completed the IDI on-line in their first language. The investigators used the group mean scores on developmental scales to evaluate whether any significant indicators of change were observed in these areas of intercultural development. Results indicated statistically significant differences in orientation to cultural diversity between Russian and American undergraduate students.

4. "Rosamede" and Gender Perception

Mariah Schumacher
David Higgins, Faculty Mentor (Department of English)
Inver Hills Community College

My research focuses on gender performativity in Shakespeare's As You Like It, and how this is reflected in Elizabethan and current society. Contrary to popular belief, portraying the opposite sex seems to be done more easily than previously thought. When analyzing this subject, I researched two books, an Encyclopedia of Philosophy, and several analysis of the play As You Like It. Throughout these analysis, I learned that there are several stereotypes within society's viewpoint of gender. These include that women must always speak when they think; that men must be the sole protectors of women, and that women are always overemotional. Every one of these ideas, of course, could be proven false. Another observation was that from the moment we are born, we become plunged into a society that will harshly mold us into our gender stereotype. This is shown from the moment we escape the womb; we become swaddled in a blue or pink blanket, depending on our sex. I also looked at the way language is used, and how masculinity tends to take over the population of positive or powerful words that could be androgynous; some examples of these words could be gentleman, mailman, or the general usage of the word "man" when describing the human race. This is most likely a result of society's idea that boys' things are superior to girls' things. Overall, I conclude that the definition of "man" and "woman" are completely reliant on society's standards.

Social Work, Sociology, Ethnic Studies, Student Development

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1. **Towards a Culturally Competent Food Shelf**
   Pajtshiab Ly and Mai Lee
   Marilyn Virgil and Cindi Yang, Faculty Mentors (Department of Social Work)
   Metropolitan State University

2. **Addressing Accessibility: Analysis of Disability Services Policy and Practice at Bemidji State University with Specific Regard to Assistive Technology**
   Maria Eastman
   Debra Peterson, Faculty Mentor (Department of Sociology)
   Bemidji State University

3. **The Arab-African Minority in East Africa Issues of Identity, Integration and Assimilation**
   Ahmed Ahmed Bani
   Kebba Darboe, Faculty Mentor (Department of Ethnic Studies)
   MSU Mankato

4. **A Time to Lead**
   Kari Cooper
   Mary Ward, Faculty Mentor (Department of Student Development & Enrollment)
   Bemidji State University

1. **Towards a Culturally Competent Food Shelf**
   Pajtshiab Ly and Mai Lee
   Marilyn Virgil and Cindi Yang, Faculty Mentors (Department of Social Work)
   Metropolitan State University

This project took place at the Hmong Community Learning Center in the Neighborhood House on the West Side of St. Paul and addressed the issue of unselected items at the food shelf. The Neighborhood House was established in 1897 and serves immigrants, refugees, and low-income populations in need of assistance. The Neighborhood House Wellstone Center food shelf is the largest single-site food shelf in Ramsey County distributing to almost 10,000 households annually. The research project included increasing awareness of canned carrots and green beans in ethnic dishes and creation of a cooking video series. Students Maita Yang, Yer Xiong, Idowu Bankole, and Toufue Moua also worked on this project.

2. **Addressing Accessibility: Analysis of Disability Services Policy and Practice at Bemidji State University with Specific Regard to Assistive Technology**
   Maria Eastman
   Debra Peterson, Faculty Mentor (Department of Sociology)
   Bemidji State University

The purposes of this project are threefold. First, this project will examine BSU's policies and practices regarding meeting the assistive technology needs of students with disabilities and how they are guided by MnSCU policies, state and federal standards, and organizations such as AHEAD. Second, this project will examine what kinds of assistive technologies are being used currently at BSU within the classroom, online and around campus. Third, areas of need are identified.

3. The Arab-African Minority in East Africa Issues of Identity, Integration and Assimilation

Ahmed Ahmed Bani
Kebba Darboe, Faculty Mentor (Department of Ethnic Studies)
MSU Mankato

The Dialogue between cultures was and remains the main road for the development of human civilization. Through the reciprocal understanding and interpretation of cultures over the centuries and millennia, those cultures have been mutually enriched, and so have made up the unique mosaic of human civilization. The movement of Arabs {Omanis and Yemenis} across the globe since the Islamic era, and the development of those communities will continue to interest policymakers and scholars for decades to come. The ethnic Arabs remain potential targets of xenophobic tendencies and violence. Such incidents have occurred not only in countries with existing ethnic tensions, like Sudan. Motivation/problem statement. The Historical back ground of the migration pattern., and to appraise the impact of the religion or culture of Islam on the Afro-Arab cultures, and its contribution to the promotion of the culture of peace and tolerance .The main focus is to identify some of the current challenges facing the Arab-African People {issues of identity, social integration and Assimilation. Results/findings/products: The most significant findings to describe is to understand the dialogue between cultures which can and must be the answer to the growing danger of various manifestations of intolerance and violence today or in the first decade of the twenty-first century. Conclusion/implications: There is gap of understanding each other, much of what is written about the relationship between the Arabs and the African continent arises from the West, and usually describes the relationship along a crude paradigm of “Arabs” versus “black Africans. But there is gap of understanding each other.

4. A Time to Lead

Kari Cooper
Mary Ward, Faculty Mentor (Department of Student Development & Enrollment)
Bemidji State University

This presentation is about my leadership roles and development within Bemidji State University and the Bemidji community in the past year. I was awarded the Dave & Kathryn Sorensen Leadership Scholarship for the FY-13 school year. This scholarship has given me the opportunity to focus both on my academic and professional leadership development. Currently I serve as the BSU Student Senate Co-President, an Orientation Leader Coordinator, a representative on the President's Student Commission, and a Board Member for the Minnesota State University Student Association. Outside of BSU, I work part-time as a Marketing Assistant and the Volunteer Coordinator at the Boys & Girls Club of the Bemidji Area. This presentation will take you through my journey as I've grown and continue to grow as an effective leader, and how I plan on using these skills in the future.

Communication Studies

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1. **Protecting the Wolf**
   Jessica Wierzchowski
   Merrie Holtan, Faculty Mentor (Department of Communication Studies)
   MSU Moorhead

2. **Unfair Campaign Communication Analysis**
   Nicole Hudak
   Leah White, Faculty Mentor (Department of Communication Studies)
   MSU Mankato

3. **Stepping Away from Creativity**
   Meghan McLaughlin
   Merrie Holtan, Faculty Mentor (Department of Communication Studies)
   MSU Moorhead

4. **Exposing Violence in Children's Films**
   Nicole Jasperson and Jessica Jasperson
   Martin Grindeland, Faculty Mentor (Department of Communication Studies)
   MSU Moorhead

1. **Protecting the Wolf**
   Jessica Wierzchowski
   Merrie Holtan, Faculty Mentor (Department of Communication Studies)
   MSU Moorhead

Wolves are a “keystone” species that naturally help regulate the populations of other animals and plants through a chain of events. Due to later hunting seasons that allowed wolves to be hunted in certain states, it is vital to educate people about the importance of wolves in the ecosystems in which they were originally found. One of the reasons cited for killing wolves was environment protection. However, there are more direct methods to protect the environment, other than hunting wolves. After the subject is discussed, the audience may consider donating to environmental protection agencies such as Defenders of Wildlife and support laws that protect our environment.

2. **Unfair Campaign Communication Analysis**
   Nicole Hudak
   Leah White, Faculty Mentor (Department of Communication Studies)
   MSU Mankato

The Unfair Campaign was a campaign in Duluth Minnesota that raised awareness of white privilege. The reason why it was important to analyze was because Duluth is one of the whitest cities in the United States and the Unfair Campaign took a new and creative approach. I used a journal article that analyzed a different public service announcement campaign and applied those same critiques to this campaign. What I discovered was that because the campaign did not present any solutions, the Unfair Campaign was not successful with their billboard and poster aspect of the campaign. The conclusion I found through this critical analysis was because the community was so offended by this campaign, it seems that if viewers are offended by a public service announcement, they might not only be turned off to that PSA but the message that they are presenting.

3. Stepping Away from Creativity

Meghan McLaughlin
Merrie Holtan, Faculty Mentor (Department of Communication Studies)
MSU Moorhead

Creativity is something we are all born with. Children use creativity to solve problems. After childhood most people lose the creativity they once had. An explanation for this is that we are educated away from creativity. We take steps away from creative problem solving while being taught toward a test at school. We are losing the opportunity to problem solve in our schools. Since we teach toward tests, we skew the concept of failure. Failure is thought of as a negative concept, but in reality, we can learn so much from failure. Stepping away from creativity is a serious issue in our modern times. We are in need of creative problem-solving individuals for the workforce, and we need creativity back in schools. Taking steps away from creativity is taking steps away from the unknown future.

4. Exposing Violence in Children's Films

Nicole Jasperson and Jessica Jasperson
Martin Grindeland, Faculty Mentor (Department of Communication Studies)
MSU Moorhead

Children's films have been popular since the beginning of the film industry. Cartoons were played as previews in the movie theatres in order to entertain children while the adults prepared for the action. As the film industry progresses, children's films have become more visually entertaining and more realistic. Certain films have been criticized for the amount of violence they portray, but children's films have not been closely examined. This study is the examination of the top 10 grossed children's films according to the box office, rated G and PG, from 2010-2012 to determine the amount of violence portrayal of each character. Using a content analysis, this study identifies amounts of violence, character's reactions to violence, and the results of violence in the form of punishments or non-punishments. The findings do suggest violence as a norm in society resulting in children's "normalization" of violence.

Film, Art Design

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1. **Science-Fiction meets Art Cinema in a Senior Film Project**
   Conor Holt
   Thomas Brandau, Faculty Mentor (Department of Film Studies)
   MSU Moorhead

2. **Gelly: An Exploration of Acrylic Gel Medium Sculptures**
   Megan Moriarty
   James Johnson, Faculty Mentor (Department of Art)
   MSU Mankato

3. **From the Eye of the LGBT Community at MNSU**
   Joshua Schutz
   Alisa Eimen, Faculty Mentor (Department of Art)
   MSU Mankato

4. **The Sassy Voice of the Goddess: Non-diegetic Female Narration in "Girl Who Lives in a Tree"**
   Simone LeClaire
   Anthony Adah, Faculty Mentor (Department of Film Studies)
   MSU Moorhead

5. **Melding Mediums, Fusing Metal and Glass**
   Dustin Swiers
   Leslie Laidlaw, Faculty Mentor (Department of Art)
   MSU Mankato

1. Science-Fiction meets Art Cinema in a Senior Film Project

Conor Holt
Thomas Brandau, Faculty Mentor (Department of Film Studies)
MSU Moorhead

In the senior seminar class in the Cinema Arts/Digital Technologies Department, senior film students must complete a final short film, a culmination of skills learned in four years of film education. While most students film in February and March, I filmed my project in October 2012, a stipulation of the Minnesota Film and TV Board Grant, which I received last year. In return for a $1,500 grant, I had to have my film completed and ready to screen at the Fargo Film Festival, March 5-9. My film is called "A Better Life," a science-fiction drama about a woman who uses a remote control to care for her comatose husband. With this film, I sought to balance the genre conventions of science fiction with the narrative and temporal style of art cinema. The film features futuristic technology, while moving back and forth between the past and present. Through the exploration of technology's impact on relationships and how we perceive the past through memory, I was able to depict an unhappy marriage that a miraculous technology both saves and destroys. I will be screening my film project and will be speaking about my experiences.

2. Gelly: An Exploration of Acrylic Gel Medium Sculptures

Megan Moriarty
James Johnson, Faculty Mentor (Department of Art)
MSU Mankato

Acrylic gel medium is typically used as an additive material for two-dimensional works of art. My work focuses on acrylic gel medium's potential to be used three-dimensionally. This plastic polymer can be shaped while still in its liquid form and dry solid in its manipulated form. My projects include several different types of gel medium which I apply to molds, lay out to dry as sheets, or pour over objects. I manipulate the gel into naturalistic forms that can hang, stand alone or be mounted on a wall. Some works include a light from within the object to ephasize texture, while others twist in a way that resembles ceramics. No matter how they are displayed, each objects shares some level of transparency, a result of the oxidation process. The oxidation process of the gel has also been an exciting challenge because, based on how the gel dries, it can be sticky, solid, opaque, clear, stretchy or rigid. Any additives to the gel, for example salt or copper, are therefore affected by oxidation. My experimentations have yielded many successes, but each work creates another question. Because there is little documented experimentation of gel medium being used sculpturally, I look to the methods of past artists dealing with the same lack of information as myself. Their exploration exhibit clues for my own project and guides me to understand failed pieces as successes. The Gelly project continues to spark new ideas and methods, which demand to be explored.

3. From the Eye of the LGBT Community at MNSU

Joshua Schutz
Alisa Eimen, Faculty Mentor (Department of Art)
MSU Mankato

Through documentary photography emphasizing collaboration and multiple perspectives, my study focuses on identity within the lesbian, gay, bisexual, and transgender community at Minnesota State University, Mankato. The concept comes at a time when LGBT Americans have entered a broad, political discussion regarding marriage equality, bullying in schools, and whether identifying as LGBT is derived from nature versus nurture. Considering the political discourse happening across the country and more specifically, in Minnesota, questions that may be overlooked are: Do LGBT students feel politicized or threatened by the larger conversation happening across the state? To what extent do LGBT students identify with common stereotypes affecting their own community? And, finally, where do students generally see themselves in terms of their identity and, specifically, as a member of a much larger institution? Little published material exists directly concerning LGBT students at MNSU, but from journal articles, past student's research, and broad sources that approach LGBT issues; I've found that one solution to give this marginalized community a voice is with the use of anonymous photography. Through the photo representations of how LGBT students see their identity within the MNSU community, I will be able to visually capture some elements of how students identify with their prescribed sexual orientation and gender. With my creative, interactive documentary photography project, I strive to find some answers to these broad questions as well as start a much larger discussion as to the needs of lesbian, gay, bisexual, and transgender individuals at Minnesota State University, Mankato.

4. The Sassy Voice of the Goddess: Non-diegetic Female Narration in "Girl Who Lives in a Tree"

Simone LeClaire
Anthony Adah, Faculty Mentor (Department of Film Studies)
MSU Moorhead

Female voiceover narrators have been conspicuously absent from classic Hollywood cinema. When they do appear, they are often accused of being subverted to the internal male narration of classic Hollywood cinema (Hollinger). I propose that part of this subversion is illustrated by the consistently diegetic nature of female voiceover narrators when they do appear. For example, Kathleen McHugh outlines the developing role of female narrators in film with her analysis of contemporary filmmaker Jane Campion, but this analysis is still limited by all of the narrator's diegetic presence in the story. Therefore, this paper will investigate the place of the non-diegetic female voiceover narrator in my senior capstone film, 'Girl Who Lives in a Tree.' Based on the expectations created by conventions of classical Hollywood cinema, I argue that my narrator can and will be used alongside other art cinema techniques to break the unity of the space-time continuum in "Girl Who Lives in a Tree."

5. Melding Mediums, Fusing Metal and Glass

Dustin Swiers
Leslie Laidlaw, Faculty Mentor (Department of Art)
MSU Mankato

My research focused on the possibilities of combining metal and glass to create a series of sculptural works. This was accomplished literally by way of the experiments I conducted with glass and copper. The interaction of two very different mediums and the juxtaposition of hard and soft elements, create an aesthetic that is reflective of the processes and material. Process is a primary motivator within my work as a sculptor. The unique quality of the materials provided an interesting combination of working procedures and intuitive actions. The multitude of results I have received surprised me and expresses there is still much to learn. I have thus far made forty seven mockups and three finished works that will be presented through a series of photographs. My work and experimenting is ongoing. The variety of color, shape and pattern of the copper alone, inside the glass, was the most surprising and enlightening. If my research shows anything, it is the multitude of variables within the creation process. Though there are similarities, many anomalies still occasionally present themselves. This opportunity granted me further extensive development of my knowledge of the materials. Despite having used both materials (metal and glass) separately in the past, I have expanded the rage of possibilities within my ideas of process and overall sculpture.

Creative Writing, Communication, Writing and Arts

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1. **Poems: *A Megan Fox Horror Movie, Dreamer, Limitless, Monarch, Outcast,* and *St. James.***
   Creative Non-Fiction: *Melted Ice Cream*
   Katie Schwarz
   Anthony Neil Smith, Judy Wilson and Marianne Murphy Zarzana, Faculty Mentors (Department of Creative Writing)
   Southwest MSU

2. **Current Events in Writing**
   Samantha Lemmerman
   Anthony Neil Smith, Judy Wilson and Marianne Murphy Zarzana, Faculty Mentors (Department of Creative Writing)
   Southwest MSU

3. **Creative Writing Reading**
   Tyson Tofte
   Anthony Neil Smith, Judy Wilson and Marianne Murphy Zarzana, Faculty Mentors (Department of Creative Writing)
   Southwest MSU

4. **Trees**
   Mackenzie Murphy
   Edward Bok Lee, Faculty Mentor (Department of Communication, Writing, and the Arts)
   Metropolitan State University

5. **Portrait of the Artist's Intention: Simulacrum and the Pulse Between the Process**
   Nick Rivers
   Kristi Frykman, Faculty Mentor (Department of Communication, Writing, and the Arts)
   Metropolitan State University

1. **Poems: *A Megan Fox Horror Movie, Dreamer, Limitless, Monarch, Outcast,* and *St. James.***
   Creative Non-Fiction: *Melted Ice Cream*
   Katie Schwarz
   Anthony Neil Smith, Judy Wilson and Marianne Murphy Zarzana, Faculty Mentors
   (Department of Creative Writing)
   Southwest MSU

Poetry is a hobby I have enjoyed pursuing in my education. The poems I plan to read today cover many aspects of my personality. A majority of them are about love or romance in one way or another. *Monarch,* for example, which is a Kyrielle, is about a relationship that has already ended, but the eyes of the speaker's lover is still a fond memory of his (and, yes, the speaker is a man, in this case). On the other hand, *Limitless,* is a Triolet poem about moving on regardless of how people view your past actions. *A Megan Fox Horror Movie* is a poem of an unusual kind because the rhyme scheme is one I made up as an experiment, not to mention the subject matter boarders cannibalism. I grew up in St. James, Minnesota, so I thought it would be appropriate to include a poem about my hometown because of the location of the conference. While deliberating which pieces to read today, I attempted to gather a collection of myself that didn't directly duplicate any subject. The creative non-fiction piece is about a memory with my father and me, which explores the effects of bipolar disorder. Through writing, I am able to put feelings into words that can otherwise become a mess if they stay isolated too long in my head. It makes me feel better, and also helps the readers feel better to relate to something similar, whether the subject be positive or not.

2. **Current Events in Writing**
   Samantha Lemmerman
   Anthony Neil Smith, Judy Wilson and Marianne Murphy Zarzana, Faculty Mentors
   (Department of Creative Writing)
   Southwest MSU

Creative writing has always been a part of Samantha Lemmerman's life. Fiction is her primary genre. Inspired by current events, she explores hot button topics such as self-harm and infidelity in the two pieces she will present. Both stories use techniques learned through experience, practice, and workshops. She will read "Heart Surgery", a flash fiction piece conceived and written just days after the General Petraeus scandal broke. The piece was awarded second place in Southwest Minnesota State University's Telling Women's Stories writing contest in 2012. She will also present a journalistic piece, "Cutting Away at Perfection: A Disturbing Trend in High Schools." Samantha hopes that her works can reach at least one person and make a lasting impact.

3. Creative Writing Reading

Tyson Tofte
Anthony Neil Smith, Judy Wilson and Marianne Murphy Zarzana, Faculty Mentors (Department of Creative Writing)
Southwest MSU

Like any writing, creative writing is an attempt to convey information to the reader. It would be simplest to define it as writing whose purpose is to entertain, but books like *1985* or *Fahrenheit 451*, while works of fiction, have had a much wider impact than simply entertaining generations. My personal definition of creative writing is writing in which the focus is on conveying personal truth, rather than fact. While there are a variety of reasons to enter this field, my own is to provide catharsis for my military experiences. For my own benefit and the education and edification of others, I would like to share the understanding I now have of the world, which is the goal of every creative writer. Most of my work stands on its own; to understand it, one only needs to know that I am a veteran and that I hope to shed light on some issues that are deeply personal, others common to modern war veterans, and still others universal to everyone who has ever served. To that end, I will be reading several poems, an essay about the psychological issues of returning to civilian society, and a non-fiction piece about life aboard a US naval vessel.

4. Trees

Mackenzie Murphy
Edward Bok Lee, Faculty Mentor (Department of Communication, Writing, and the Arts)
Metropolitan State University

I will be reading a short story from my unofficial “biomythography” collection Down Home: Bluff Tales on the Missicroixan. Paying close attention to setting, point of view and prose consciousness, I speak about my experiences in Western Wisconsin and how that has informed my understanding of home and the importance of family.

5. Portrait of the Artist's Intention: Simulacrum and the Pulse Between the Process

Nick Rivers
Kristi Frykman, Faculty Mentor (Department of Communication, Writing, and the Arts)
Metropolitan State University

As an artist, I have found the most challenging problem I face is accepting the loss of transmitting intention, meaning and process inherent in creations of artwork. I have focused primarily on process and the emotions and meaning which become associated to artistic process. This series of my work has been inspired and influenced by the concepts of French cultural theorist Jean Baudrillard from his book on simulacra and simulation while also influenced by the "isms," ideologies, and belief systems which shape human experience. Apparent in my work are layers of texture, theme, and strong emphasis on repetition, and layers of a theme which strand through several pieces, until eventually, a stencil, or a word is consumed and left without the meaning to which it originally was prescribed. Often what is created from the by product is as intriguing and insightful as the intention. Because of this I often work on vellum paper, acetate or acrylic sheets, by which pieces may be viewed from both sides. The primary interest has been to accept the viewer's reaction to a piece without attachment or expectation, and to let go of the desire to produce something which is definitive or objective. There is a relationship between simulacrum and what I have described here in this loss of transmission from the artist to the viewer. This relationship is reflected upon viewing the ten 16"x 20" works I have created.

Biology, Chemistry and Geology, Mathematics and Statistics

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1. **Examining the Verity of the Empty Niche Hypothesis Using Local Wetlands as Models**
   Nicholas Stephens
   Bradley Cook, Faculty Mentor (Department of Biological Sciences)
   MSU Mankato

2. **3' Modifications on Myxomycete Slime Mold Mitochondrial mRNA Transcripts**
   Anna Hunt & Ariel Martin
   Tamara Mans, Faculty Mentor (Department of Biology)
   MSU Moorhead

3. **The Effects of Bisphenol-A (BPA) on the Feminization of Danio Rerio**
   Lina Wang
   Theresa Salerno, Faculty Mentor (Department of Chemistry and Geology)
   Shannon Fisher, Faculty Mentor (Department of Biological Sciences)
   MSU Mankato

4. **Diversity of Airborne Insects in the Prairie and Coniferous Forest of the SMSU Wildlife Area**
   Trista Hacker and James Oliver
   E.A. Desy, Faculty Mentor (Department of Biology)
   Southwest MSU

5. **Exploration of Music Theory Using Mathematical Modeling Techniques**
   Sarah Painter and Leah Lumley
   Jeffrey Ford, Faculty Mentor (Department of Mathematics and Statistics)
   MSU Mankato

1. **Examining the Verity of the Empty Niche Hypothesis Using Local Wetlands as Models**
Nicholas Stephens
Bradley Cook, Faculty Mentor (Department of Biological Sciences)
MSU Mankato

Invasive species are a major concern for many ecologists, park managers, and restoration scientists. The empty niche hypothesis proposes that introduced plant species become invasive because they can exploit unused resources, or empty niches, in a community. This study looks for empty niches by using historical descriptions of local wetlands to make models based on native species and their resource use. If there are any gaps in resource use that a commonly invasive species, Phalaris arundinacea (reed canary grass), Typha angustifolia (narrow-leaf cattail) or Typha x glauca (hybrid cattail), would fit into, then that wetland will be considered to have an empty niche. Wetlands with an empty niche should have the invasive species currently present; this will be examined in field studies, along with the degree to which the invader is in the niche indicated by the model.

2. **3’ Modifications on Myxomycete Slime Mold Mitochondrial mRNA Transcripts**
Anna Hunt & Ariel Martin
Tamara Mans, Faculty Mentor (Department of Biology)
MSU Moorhead

The myxomycete slime molds use several unique forms of RNA modification on their mitochondrial transcripts, including five different varieties of RNA editing, plus poly(U) tailing. Prior investigations have demonstrated that poly(A) tails are missing from at least two mitochondrial mRNAs in Physarum polycephalum and one mRNA in Stemonitis flavogenita. Instead, non-encoded poly(U) tails of varying length were discovered at the 3’ ends of these transcripts. Using a modified “anchor” approach, we are investigating both RNA editing and poly(U)tails by amplifying mitochondrial mRNA transcripts from Didymium nigripes. We isolated total mRNA then used yeast poly(A) polymerase enzyme in vitro, supplied with only GTP nucleotides to add 3’ poly(G) extensions to the pools of RNAs. We reverse transcribed with a tagged poly(C) primer to create cDNAs with a known end sequence. We have PCR amplified coI transcripts from the pools using “internal” forward primers and a reverse primer corresponding to the known “tag” sequence. We have cloned and sequenced our products to determine the uncharacterized coding sequence and the 3’ UTR of these mRNAs. Editing sites and non-templated U’ are being identified by comparison with corresponding DNA sequence.

3. The Effects of Bisphenol-A (BPA) on the Feminization of Danio Rerio

Lina Wang
Theresa Salerno, Faculty Mentor (Department of Chemistry and Geology)
Shannon Fisher, Faculty Mentor (Department of Biological Sciences)
MSU Mankato

In waters across the globe, an endocrine disrupter-related increase in the feminization of male fish has been observed. Bisphenol-A (BPA), farm runoff, and soil contaminants from wastewater treatment plants can increase aquatic endocrine disrupter concentration. Three replications of four 42-liter tanks with BPA concentrations of 0.0, 0.2, 2.0, and 20.0 parts per billion (ppb) were run for 1 week. Eggs were collected on day 7 after a 14:10 hour light:dark cycle. The ANOVA among BPA concentrations was significant ($P<0.001$). The Holm-Sidak test detected a significant difference in mean fertilization percentage between 20.0 ppb (1.78%) and all of the lower concentrations (0.0, 0.2, and 2.0 ppb; all >85%; $P<0.050$). Visually, the offspring appeared to have a larger female:male ratio in higher BPA concentrations; however, visual gender identification is not always reliable. Further testing (phase 2) for P250 aromatase using Reverse Transcriptase- Quantitative Real time Polymerase Chain Reaction (RT-QPCR) was done to more accurately determine the male: female ratios. RNA isolation was done using the RNeasy procedure from Qiagen for three offspring from 0.0, 2.0, and 20.0ppb and two offspring from 0.2ppb. 2-step RT-PCR method was used to analyze cDNA obtained from the RNA isolation with high capacity cDNA reverse Transcription Kit. Efficiency curves and PCR analysis was inconclusive, but did show that there are high expressers and low expressers of aromatase B in *D. rerio*.

4. Diversity of Airborne Insects in the Prairie and Coniferous Forest of the SMSU Wildlife Area

Trista Hacker and James Oliver
E.A. Desy, Faculty Mentor (Department of Biology)
Southwest MSU

Arthropods are the most diverse group of organisms on Earth, and the diversity of the insect populations plays a major role in developing a healthy ecosystem. The Southwest Minnesota State University Wildlife Area is a combination of multiple habitats including the prairie and coniferous forest. In order for these environments to ecologically thrive, there should be an adequate level of insect variety. The purpose of our study was to compare the airborne arthropod diversity of the restored prairie and coniferous forest habitats in the SMSU wildlife area. Our research group constructed yellow pan traps to capture flying insects in these regions. The results show that the restored prairie had a greater flying insect diversity than the coniferous forest habitat. These results align with previous studies that claim prairies have a higher insect diversity due to greater plant diversity (Wardhaugh et al., 2012).

5. Exploration of Music Theory Using Mathematical Modeling Techniques

Sarah Painter and Leah Lumley
Jeffrey Ford, Faculty Mentor (Department of Mathematics and Statistics)
MSU Mankato

There is a deep connection between mathematics and music. The music was created first, however, and the math behind it is still being discovered – from counting beats to abstract algebraic models. We are looking for mathematical representations for two specific aspects of the relationship. One aspect relates multiple musical notes. All of the current research on this topic uses the frequency of the notes in the equal temperament method of tuning. This is the tuning like that of a piano. Bands and orchestras do not use the equal temperament method of tuning, when tuning chords, however. They use a method of tuning called just intonation. We hypothesize that using just intonation creates less sporadic sound waves, causing our ears to perceive them as less dissonant. We can look at the sound wave graphs of chords using the two tuning methods to compare and contrast. Another aspect of the relationship considers not just the sounds but the compositions. We will be using a specific type of music, change-ringing, the art of ringing a set of tuned bells in mathematical patterns without attempting to produce a melody. We will attempt to create models of the change-ringing composition process. Our exploration will use previously developed modeling techniques, as well as, their application to our key topics of tuning methods and change-ringing composition.

Psychology, Counseling and Student Affairs

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1. **The Heard and the Hiding**
   Samuel Birkholz
   Marsha Driscoll, Faculty Mentor (Department of Psychology)
   Bemidji State University

2. **Multi-Cultural Experiences and Understanding**
   Lamont Scaife
   Kevin Filter, Faculty Mentor (Department of Psychology)
   MSU Mankato

3. **IT CAN W8: An Intervention to Decrease Cell Phone Use While Driving**
   Sarah Frisch
   Angela Fournier, Faculty Mentor (Department of Psychology)
   Bemidji State University

4. **Diversity Endorsement Program Proposal at MSU Moorhead**
   Yi Chu and Katrina Brekke
   Donna Brown, Faculty Mentor (Department of Counseling & Student Affairs)
   MSU Moorhead

1. The Heard and the Hiding

Samuel Birkholz
Marsha Driscoll, Faculty Mentor (Department of Psychology)
Bemidji State University

A literature review of empirical research involving introvert and extrovert personality types. Taking suggestions made in the book Quiet: The Power of Introverts in a World That Can't Stop Talking, written by Susan Cain, a more in-depth analysis is constructed using data from various studies supporting these personality differences, and the important part introverts play in society. Most people can discern the basics between what makes the definition of an introvert a near polar opposite from an extrovert, but underneath the social factors lays a trove of creativity and useful ideas forming the backbone of much advancement in literature, theater and technology seen around the world today. From janitors to executives in fortune five-hundred companies, introverts have always been overshadowed by the preference for an extrovert type of personality in American daily lives.

2. Multi-Cultural Experiences and Understanding

Lamont Scaife
Kevin Filter, Faculty Mentor (Department of Psychology)
MSU Mankato

The primary goal of my research project is to understand cultural understanding among college students at MSU. My research relates to “the contact hypothesis”, developed by American psychologist Gordon Willard Allport. The contact hypothesis briefly describes what situations are necessary for cultural understanding amongst two different types of groups to occur. This is important because this will help us understand relationships, and connections formed within college. The information from this research could be used by event planners’ that focus on creating diversity events that educated students’ about different types of people and cultures. My research design is an online survey that consists of two questionnaires, one of which has six questions and the other of which has 10 questions. My survey asks questions to find answers to my hypothesis, which is that in order for someone to gain true cultural understanding of a culture different from her/his own, she/he not only has to have some type of interaction or connection with someone from a different background, but she/he must have actively sought out the connection (as compared to if the interaction was somehow required or was an accident). I hope to find a connection between seeking out a cultural experience and developing cultural understanding. I will also present some ideas on how to improve cultural understanding and how to increase the number of students actively seeking an interaction with ethnic and culture groups different from their own.

3. IT CAN W8: An Intervention to Decrease Cell Phone Use While Driving

Sarah Frisch
Angela Fournier, Faculty Mentor (Department of Psychology)
Bemidji State University

Distracted driving is a dangerous behavior that has been increasing, resulting in an increase in fatal crashes (Wilson & Stimpson, 2010). Cell phone use while driving, a prominent type of distracted driving, was examined using the Theory of Planned Behavior to decrease this behavior on the BSU campus. An ABA reversal design was used to measure the effects of the intervention (including banners, flyers, and pledge sheets) on reducing cell phone use while driving. Seat-belt use and gender were also measured in the study. A total of 4,386 observations were made at two chosen locations. Results showed no decrease in overall observed cell phone use but auditory use was significantly lower during the second baseline phase than during the first baseline or intervention phases. Results also showed women were significantly more likely than men to wear seat-belts. The results did not conclusively show effectiveness of the intervention in decreasing cell phone use. Further study is necessary to determine what interventions are effective in reducing this behavior.

4. Diversity Endorsement Program Proposal at MSU Moorhead

Yi Chu and Katrina Brekke
Donna Brown, Faculty Mentor (Department of Counseling & Student Affairs)
MSU Moorhead

Studies have shown that by having a significant understanding of diversity and culture, students can appreciate cultural pluralism and increase awareness toward social inequalities. Possessing this knowledge benefits individuals as well as communities and has the potential to cause positive changes in society. By researching examples from universities in the U.S., analyzing current organizational structure and programs of the institution, and conducting qualitative and quantitative research, this study examines the feasibility of implementing an optional “proficiency in diversity understanding” endorsement at MSUM.

Driving Directions to Minnesota State University Mankato

From the North

Travel south on Highway 169 to Mankato. Take the Riverfront Drive exit. Turn left (north) onto Riverfront Drive and continue to Stoltzman Road. Turn right (east) onto Stoltzman Road and continue until you get to Stadium Road. Turn left onto Stadium Road and continue up the hill to Ellis Avenue. Turn left onto Ellis Avenue. The Visitors Pay Lot 4 entrance is on the left (west) side of the street.

From the South

Travel north on Highway 169 to Mankato. Take the Riverfront Drive exit. Turn right (north) onto Riverfront Drive and continue to Stoltzman Road. Turn right (east) onto Stoltzman Road and continue until you get to Stadium Road. Turn left onto Stadium Road and continue up the hill to Ellis Avenue. Turn left onto Ellis Avenue. The Visitors Pay Lot 4 entrance is on the left (west) side of the street.

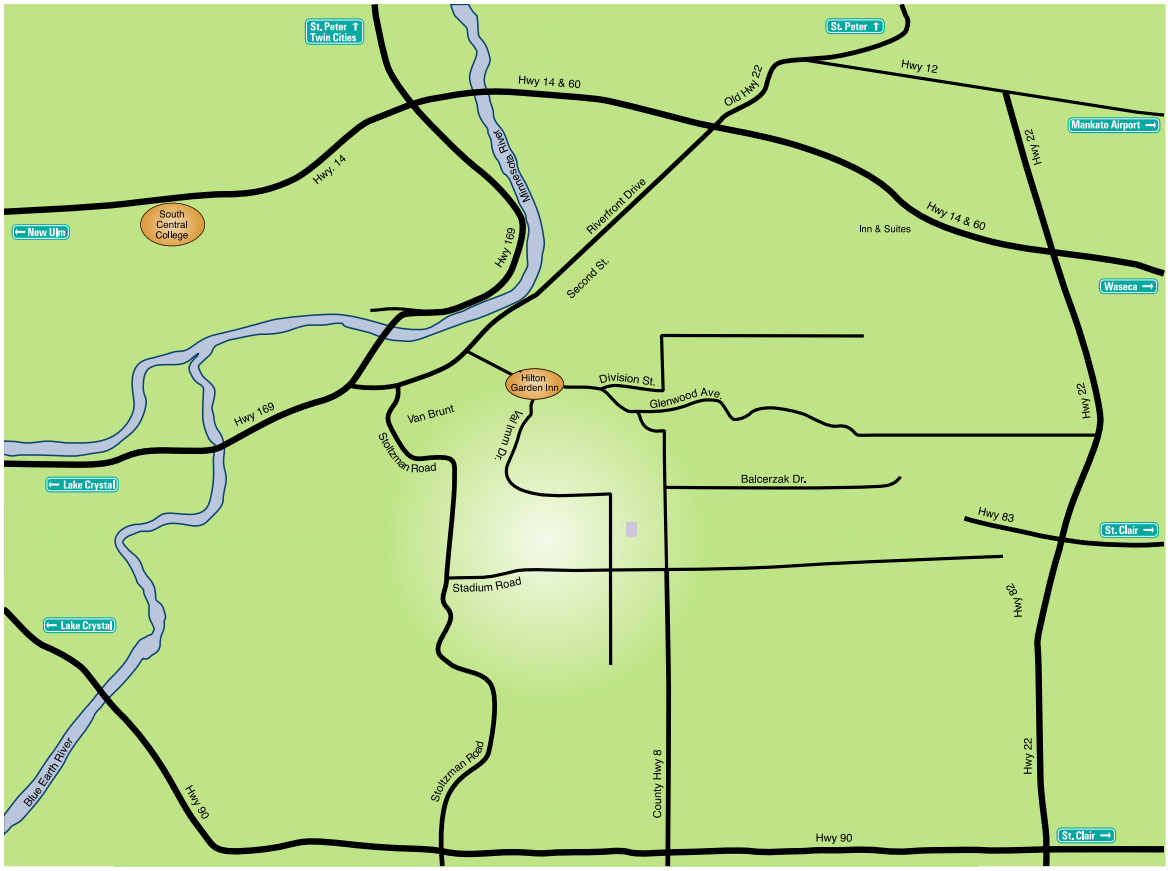
From the East

Travel west on Highway 14 to Mankato. Take the Highway 22 exit and travel south on Highway 22 to Highway 83. Turn right (west) onto Highway 83 and continue to Victory Drive. Turn left (south) onto Victory Drive and continue to Stadium Road (this will be the first turn on the right). Turn right (west) onto Stadium Road and continue to Ellis Avenue. Turn right onto Ellis Avenue. The Visitors Pay Lot 4 entrance is on the left (west) side of the street.

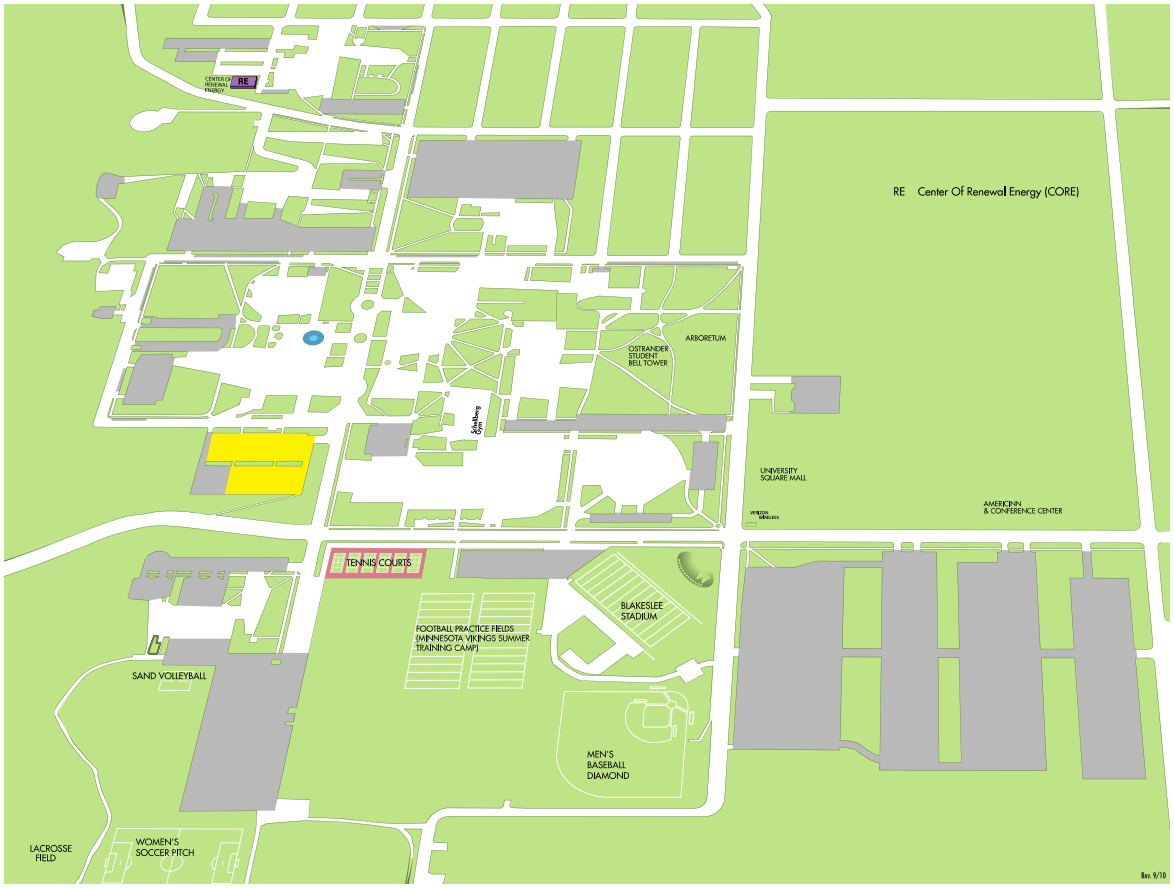
From the West

Travel east on Highway 14 to Highway 169. Take the Highway 169 South exit. Turn right (south) onto Highway 169. Take the Riverfront Drive exit. Turn left (north) onto Riverfront Drive and continue to Stoltzman Road. Turn right (east) onto Stoltzman Road and continue until you get to Stadium Road. Turn left onto Stadium Road and continue up the hill to Ellis Avenue. Turn left onto Ellis Avenue. The Visitors Pay Lot 4 entrance is on the left (west) side of the street.

Map of Greater Mankato, Minnesota



Campus Map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OSTRANDER STUDENT BELL TOWER
UNIVERSITY SQUARE MALL
AMERICINN & CONFERENCE CENTER
TENNIS COURTS
BLAKESLEE STADIUM
FOOTBALL PRACTICE FIELDS (MINNESOTA VIKINGS SUMMER TRAINING CAMP)
SAND VOLLEYBALL
MEN'S BASEBALL DIAMOND
LACROSSE FIELD
WOMEN'S SOCCER PITCH
Rev. 9/10

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