# *The 11th Annual "Celebration of Student Research & Creative Works"*

**April 13, 2006**

Northern Michigan University

## Celebration of Student Research & Creative Works
## Northern Michigan University

April 13, 2006, marks the eleventh annual symposium of student presentations entitled "Celebration of Student Research and Creative Works." The celebration is from 9:00 a.m. to 4:00 p.m. Poster presentations will be in the Peter White Lounge area and oral presentations will be in the Marquette Room of the Don H. Bottum University Center. This event provides our students an excellent opportunity to gain experience in presenting their own work and will highlight, for the entire university community, the student/faculty mentoring of which we are so proud. Both undergraduate and graduate students have been invited to present the results of their independent scholarly and creative work.

This celebration is sponsored by the Offices of Academic Affairs and Graduate Studies.

# 2006 Northern Michigan University TLC Student Awards

### These awards recognize innovative uses of the laptop in the academic environment by students

**Shelby Mitchell, Department of Health, Physical Education and Recreation**

**Traci Maki, Department of Health, Physical Education and Recreation**

**Doug Tosa, Department of Geography**

**Alex Hansen, Department of Art & Design**

# PROGRAM
# April 13, 2006

## MARQUETTE ROOM

9:00 Opening Session: Dr. Fred Joyal, Provost & Vice President of Academic Affairs, will introduce President Leslie Wong

9:30 Nicole Fadellin: A Translation of Los Mochos by Ignacio Solares

9:45 Aaron Clemins: Decreasing Injury Risk Factors in Golfers and Enhancing Golf Performance through a Fitness Program

10:00 Gerrit Cain: Relationships between Stream Habitat and Brook Trout and Steelhead Trout Abundance in Pictured Rocks National Lakeshore

10:15 Hope O'Donnell: Clonig of the Region Coding for the Ectodomain of BAFF in a Bacterial Expression Vector

10:30 Nicole White: Evaluation of the Effect of Barriers on Fish and Parasite Communities in the Miner's River in Northern Michigan

10:45 Robert Bowen: Using Regression Analysis to Predict Oxygen Uptake during V1 Treadmill Roller Skiing

11:00 Traci Maki: To Improve Social Interaction in Children with Autism Spectrum Disorder through Social Health Education

11:15 Molly Dillow: Increasing Physical Activity Levels in Corporate Workers

11:30 Karlee Ericksen: Reducing Stressors in Gay, Lesbian, Bisexual and Transgender Students through Education

11:45 Kelyn Fogelsonger: Chemotherapy Related Cognitive Dysfunction

12:00 Daniele Morey, Jessica Beinlich, Trish Streinbrecher, Auna Oman: Celebrate Reading with a READ IN

12:15 Lara Jin Qiu-ting Esser: The Osmoregulatory Ability of Freshwater Crabs and its Implications for Biogeographical Theory

12:30 Brian Anderson: Should the Federal Government Continue to Increase Military Spending?

12:45 Katie Helminen: To Increase Self Esteem in Young Women with Eating Disorders through Education

1:00 Nathan Fazer, Joshua DeVries, Trevor Havelka, Jason McCarthy: The Impact of Rental Housing in Marquette

1:15 Angela Bogeman: The Real Story about Fragile X Syndorme

1:30 Mindy McCutcheon: Exercise Effort of a Sled Dog Driver during Elite Ultraendurance and Novice Competitive Events

1:45 Stephanie Howe: To Increase Self-Esteem in Females through Fitness Education

2:00 Dale Throenle: What if a Classroom was Run Like a Business?

2:15 Jason Fulton: Introduction to and Applications of Markov Chains

2:30 Shelby Mitchell: Decreasing the Risk of Sexual Assault in College Women through Education

2:45 Maureen Latvala: Women of the Beat: A Comprehensive Website

3:00 Zach Ziegler: More than Words: A Choral Composition

3:15 Correy Kowall & Brian Krent: Distributed Evolution of Self Assembling Agents

3:30 Brian Lowis: Nash Equilibria

ORAL PRESETNATION

**Should the Federal Government Continue to Increase Military Spending?**

Brian L Anderson, Undergraduate Student, HPER Department (Patricia Hogan, Faculty Advisor)

One of the main components of HL 440, Critical Issues in Health, is to enhance health literacy of students by improving their ability to use critical thinking to evaluate an issue or problem. The first step in this process is to identify an issue or problem. The issue I chose to address is whether the Federal Government should continue to increase military spending. This project involved defining the terms of the issue, researching to identify reasons and evidence to support both pro and con conclusions, identifying prescriptions, implications, and assumptions for each side, and evaluating the arguments for truth, consistency, clarity, logicalness, accuracy, and fairness. After evaluating both sides' arguments, I wrote an opinion editorial piece (based on my research) supporting my position on the issue.

**The Real Story about Fragile X Syndrome: the Genetic, Physical, Behavioral, and Emotional Struggles**

Angela Bogeman, Undergraduate Student, Department of Biology (Mohey Mowafy, Faculty Advisor)

Fragile X syndrome is a genetic disorder that is passed from a carrier female to her children through the X chromosome. This syndrome is then considered to be X-linked and fifty percent of the children of a carrier female will be affected with Fragile X syndrome by pre-mutation (carrier) or full mutation. If a mother were to pass on the disorder to a son, in which he receives only a partial mutation he then is considered a carrier and could pass the disorder on to fifty percent of his daughters. Typically a male with the full mutation will never reproduce even though all reproductive parts are mature and functioning. Fragile X syndrome is typically first recognized by the many physical features including: long face, protruding forehead, large birth weight, and enlarged gonads. Behaviorally those with Fragile X syndrome may exhibit hyperactivity, troubles sleeping, a discomfort in being touched by anyone, inability to be potty trained, and many more. This presentation will discuss the physical features, emotional struggles, behavioral problems, and many other scientific distinguishes for fragile x syndrome.

**Using Regression Analysis to Predict Oxygen Uptake during V1 Treadmill Roller Skiing**

Robert Bowen, Graduate Student, HPER Department(Phil Watts, Faculty Advisor)

The use of regression equations to predict oxygen uptake in relation to speed, grade, power output, and multiple subject demographics is common in cardiac rehabilitation and athlete fitness testing. Research has suggested that sport specific fitness testing is appropriate to aid in the development of more concisely focused training programs. This study focused on the development of a cross country skiing specific predictor of oxygen uptake and utilized statistical regression techniques to aid in the development of a linear equation. The primary intention of the developed equation was to aid in the design of oxygen uptake testing protocols in which specific temporal criteria must be met in order to validate a tested measurement. The regression equation predicted oxygen uptake with a realitively high rate of accuracy when analytical and data limitations were accounted for.

**Relationships between stream habitat and brook trout and steelhead trout abundance in Pictured Rocks National Lakeshore**

Gerrit R. Cain, Graduate Student, Biology Department (Jill Leonard, Faculty Advisor)

Potadromous coaster brook trout (Salvelinus fontinalis) were once abundant in Lake Superior yet experienced sharp declines by the turn of the 20th century. The interaction between native brook trout and exotic steelhead (Oncorhynchus mykiss) is unclear in Lake Superior tributaries. Prior work examining interactions between these two species has mainly focused on stream resident populations. Some of these studies suggest that habitat characteristics influence species abundance and habitat partitioning. Our study examines the relationship between stream habitat conditions and the relative abundance ratios of brook trout and steelhead. Six 150 m sites were surveyed at approximately monthly intervals in two streams within Pictured Rocks National Lakeshore from May to November in 2004 and 2005. Significant negative correlations between mean current velocity and depth versus brook trout abundance were observed in Mosquito River. Negative relationships between mean site velocity and steelhead abundance were also observed in the Mosquito River over the entire sampling season and in the threee summer months. Brook trout and steelhead habitat selection in Great Lakes tributaries may differ from those observed in stream resident population studies. Variation of habitat characteristics as well as seasonal changes in stream conditions influences the relative abundances of brook trout and steelhead.

**Decreasing Injury Risk Factors in Golfers and Enhancing Golf Performance through a Fitness Program**

Aaron Clemins, Undergraduate Student, HPER Department (Patricia Hogan, Faculty Advisor)

My mission is "To decrease injury risk factors in golfers and enhance golf performance through a fitness program."
Target Population: Golfers
Dependant Variable: Injury risk factors, golf performance
Independent Variable: Fitness program
There appears to be a need for golfers to maintain a good level of flexibility and overall physical fitness. According to the U.S. Consumer Product Safety Commission, "There were more than 109,000 golf-related injuries treated in doctors' offices, clinics and emergency rooms in 2003, incurring a total cost of more than $ 2 billion"(Rozycki, 2005).
Since golfers are at such a risk for injury, there is a need for fitness programs that can help reduce the golfer's risk of injury while at the same time can help increase their overall golf performance. This is the goal I hope to achieve through my program so that everyone can enjoy the great game of golf without having to suffer through the pain and stress golf-related injuries can cause.

**Increasing Physical Activity Levels in Corporate Workers**

Molly Dillow, Undergraduate Student, HPER Department (Patricia Hogan, Faculty Advisor)

In my undergraduate research project, I planned a program design and developed an evaluation plan to determine the effectiveness of a health promotion program aimed at increasing physical activity levels in workers during the workday that can be implemented in almost any corporation, whether large or small. I developed a baseline-and goal-setting approach pedometer program that focused mainly on increasing activities of daily living. By using the particular approach that I did, individuals were able to modify their goals to their own individual needs. My program is extremely relevant to present health issues in America, particularly to the increase in the obesity epidemic due to individuals becoming more reliant on mechanized labor aids in corporations (which, in turn, leads to a lack of physical activity, cafeteria-style eating habits, and eventually, weight gain).

**Reducing Stressors in Gay, Lesbian, Bisexual, and Transgender Students through Education**

Karlee J. Ericksen, Undergraduate Student, HPER Department (Patricia Hogan, Faculty Advisor)

In Health Program, Planning and Evaluation (HL 367) I had to develop a mission statement. My mission was to reduce stressors in gay, lesbian, bisexual, and transgender (GLBT) students through education. For my mission, I sought to show a need for an intervention, find a way to test stressors in GLBT students, locate an agency that was compatible with my mission, develop an intervention, state objectives of my intervention, market my program, find funding and address safety issues involved with my program.

After extensive research I found that GLBT students often face taunting, exclusion and abuse at school and home. These trials lead to GLBT students at a higher risk of dropping out of school, running away or committing suicide. Also, less than fifty percent of schools address GLBT students in their anti-bullying policies. I felt this neglect illustrates that GLBT students are inadequately represented in school policies/programs.

This project gave me an opportunity to research and better understand how much work goes into developing and implementing a school program. I hope, as a future teacher I will be able to implement a similar program in the school where I work.

**The Osmoregulatory Ability of Freshwater Crabs and its Implications for Biogeographical Theory**

Lara Jin Esser, Graduate Student, Department of Biology (Neil Cumberldige, Faculty Advisor)

True freshwater crabs (Potamoidea) belong to the crustacean order Decapoda and are always found in freshwater habitats during all the stages of their life cycle. The distribution of the freshwater crabs as a whole is circumtropical on continents and islands. Their dispersal and distribution is, however, restricted by their lack of larval planktonic dispersal stages, and by their restriction to inland freshwater habitats.

One biogeographical hypothesis assumes that freshwater crabs have no tolerance of seawater, cannot survive for long in the sea, and cannot disperse across the oceans. Another competing hypothesis assumes that freshwater crabs must have reached their present distribution on islands by crossing saltwater, either by dispersing underwater, or by being carried (accidentally) on floating objects.

The present study examines the osmoregulatory abilities of two families of freshwater crabs from Thailand by exposing the crabs to a range of salinities when either fully or partially immersed to evaluate survival times. Preliminary results indicate that there was no difference in salinity tolerance between species from different families, and that experimental animals were able to survive for at least 6 days in dilute seawater. If confirmed by further studies, these results would support the dispersal hypothesis that assumes that freshwater crabs can cross seawater barriers.

**Chemotherapy Related Cognitive Dysfunction**

Kelyn Fogelsonger, Undergraduate Student, Department of Clinical Laboratory Sciences (Mohey Mowafy, Faculty Advisor)

Cognitive dysfunction is a newly recognized symptom that accompanies some cancer treatments. Although classified as a symptom, the fine details of the condition have yet to be documented. The focus of this research is on Chemotherapy Related Cognitive Dysfunction (CRCD), and its related side effects. CRCD can be present in individuals in a variety of severity levels. Symptoms and occurrence vary depending on the type of cancer, duration of treatment, and harshness of the treatment.
Physicians have developed numerous ways to distinguish CRCD from other possible causes of mental decline. Tests have been created to measure cognitive ability, memory, thinking skills, etc. and groupings of these tests are given to patients with possible CRCD symptoms.

In depth studies relating to this issue have only recently begun. The main question, still unsolved, is the definitive cause of CRCD. Despite this, there are a variety of lifestyle changes patients can complete to make the accompanying symptoms more livable. Even though all the questions surrounding CRCD have yet to be answered, there is hope in the form of numerous ongoing studies that these questions will be answered in the near future.

**The Impact of Rental Housing in Marquette, and Implications for Planning**

Joshua DeVries, Nathan Fazer, Trevor Havelka, and Jason McCarthy, Undergraduate Students, Department of Geography (Stephen DeGoosh, Faculty Advisor)

There seems to be a perception within the city of Marquette that an excessive number of rental units exist, and these units have a negative effect on the cost of providing municipal services and contribute to the decline of certain neighborhoods. Factors contributing to this analysis are 1) age of housing units, 2) location of rental units, 3) off-campus residences of NMU students, 4) police violations, and 5) zoning and other land-use violations.

A GIS (geographic information system) was developed to examine the relationships of these factors, and to illustrate the effectiveness of GIS as a planning/decision-making tool. By analyzing and manipulating data, several GIS map layers were produced to reflect various aspects of the housing stock in the city. Analysis included what percentage of the rental units in Marqette were related to NMU students and what percentage of complaints came from these units. Analysis determined a disproportionate number of complaints coming from NMU student rentals. However, zoning violations appeared to be divided almost equally between student-occupied units and others in the city.

**An Introduction to and Applications of Markov Chains**

Jason Fulton, Undergraduate Student, Department of Mathematics (Sujay Datta, Faculty Advisor)

The presentation may or may not include the following material:

1. What is a Markov chain? How to simulate one, Markov property.

2. "It's all just matrix theory."
3. Basic limit theorem: convergence of distribution to stationarity.
4. Example of importance: generating a random object using Markov chains, Markov sampling, approximate counting.
5. Proof of theorem. Along the way important concepts such as recurrence and coupling are presented in detail.
6. Strong Law of Large Numbers for Markov chains.
7. Branching processes.
8. More on recurrence: electric networks.
9. Time reversibility: birth and death chains, random walks on graphs, Metropolis algorithms.
10. Speed of convergence to stationarity, card shuffling.
11. Simulated annealing.
12. Markov sampling (Gibbs sampling, Markov chain Monte Carlo) and Bayesian statistics. A (discrete) change point example.

**To Increase Self-Esteem in Young Women with Eating Disorders through Education**
Katie L. Helminen, Undergraduate Student, HPER Department (Patricia Hogan, Faculty Advisor)

In my program planning and evaluation class, our major project involved coming up with a mission statement, engaging a review of the literature to see how to best program to accomplish the mission in a safe way, and planning for evaluation to show how we would collect evidence to show that we had met the mission. The mission I selected was "to increase self-esteem in young women with eating disorders through education". The program was designed according to evidence-based literature found in a review of the literature. The literature review also helped me theoretically define and graphically depict the dependent variable, self-esteem, and helped with my finding a valid and reliable tool to measure self-esteem. I also designed and graphically depicted an evaluation plan (pretest, posttest, control group design), developed a newsletter and brochure for the program, and located a funding source for the program.

**To Increase Self-Esteem in Females through Fitness Education**
Stephanie Howe, Undergraduate Student, HPER Department (Patricia Hogan, Faculty Advisor)

Using scholarly articles, books, and online resources I conducted a research project designed to improve self-esteem in women through fitness education. My project is based on interventions that have been successful in the literature that I reviewed. In my project I state the need for my program, the goals and objectives of my program, the operational and theoretical definitions of self-esteem, the validity and reliability of my program, my intervention strategy, and an evaluation of my program. I also developed a newsletter and brochure, and found a potential funding source for my proposed program.

**Distributed Evolution of Self Assembling Agents**
Correy Kowall & Brian Krent, Undergraduate Students, Department of Mathematics and Computer Science (Jeffrey Horn, Faculty Advisor)

In this project we approach the search for synthetic creative attributes with a genetic search of agents tested in a simulated subset of the problem spaces wherein agents or players may create or alter the constraints of the problem. Specifically we speculated that "Manipulations" including "move," "resize," "attach," "detach" were sufficient capabilities to allow a neural network controlled agent to operate in a "creative" and "constructive" way. By measuring the difference between the "Manipulator" and its constructs we can guide the genetic search toward agents that create things like themselves.
In order to test a sufficient number of manipulators we simulate them on a distributed or "cluster" computer.

**Women of the Beat: A Comprehensive Website**
Maureen E. Latvala, Graduate Student, Department of English (Bill Knox, Faculty Advisor)

Women of the Beat is a website created by three graduate students, Maureen Latvala, Elisabeth Massie, and Margaret Helwig, to raise awareness of the significant role many women played in the Beat movement. There is an overall lack of information and scholarship about these women, and our site strives to provide as much accurate information about them as possible. It contains profiles of 32 women, links to other resources about them, photographs of them, and listings of their creative works. It also briefly contextualizes them within the movement and as precursors to the women's movement of the 1960s.

**Nash Equilibria by John Nash**
Brian D. Lowis, Undergraduate Student, Department of Mathematics (Sujay Datta, Faculty Advisor)

In this presentation, I will discuss the Nash Equilibria in a payoff matrix as well as economic applications of this thoerem including option pricing and perfect subgame equilibria.

**To Improve Social Interaction in Children with Autism Spectrum Disorder Through Social Health Education**
Traci Maki, Undergraduate Student, HPER Department (Patricia Hogan, Faculty Advisor)

Using my NMU laptop, scholarly articles and printed books, I created a program for children with autism spectrum disorder based on described interventions and programs researched in my literature review. In my project, I describe the overall need for the program, as well as its goals. The theoretical and operational definitions of social interaction, how I will ensure validity and reliability in measuring social interaction, the program objectives, the intervention strategy, and an evaluation of the program as a whole are also discussed. I applied the concepts of health literacy (critical thinking, self-directed learning, displaying responsible professionalism, and communicating effectively) in order to develop my program to its full potential.

**Case Study: Exercise Effort of a Sled Dog Driver during Elite Ultraendurance and Novice Competitive Events**
Mindy McCutcheon and Stephanie Howe, Undergraduate Students, HPER Department (Donna Marlor, Faculty Advisor)

The sport of dog sled racing has evolved from its origins as a mode of transportation in an arctic wilderness environment to a competitieve sport. Mushers involved in competitve races are known to experience extreme mental and physical fatigue. Previous research on mushers participating in the Iditarod has established that mushing requires a high caloric expenditure, however, the level of exercise intensity was not established. Dietary intake of mushers during the Iditarod has been documented as moderate in carbohydrate, approximately 45% of total calories. Other winter competitive sports such as cross-country skiing are highly aerobic and require supplementation with carbohydrate to minimize fatigue and improve performance, with carbohydrate recommendations at 60-70% of total calories. In general the reliance upon carbohydate substrate sources, as a percentage of total substate, follows the percentage of maximum heart rate pattern. Thus, work within a heart rate zone of 50-75% of maximum would correspond to a level of exercise where 50-75% of the energy expended would be derived from carbohydate sources. To date, there has been no evaluation of the aerobic intensity of mushers during a multi-stage, ultradistance event, nor of mid-distance novice races. This is an exploratory descriptive study in design. The purpose of this study is to assess exercise intensity during two types of sled dog racing events, 1) a multi-stage ultradistance event and 2) novice, mid-distance event in order to provide a basis for determining nutrition recommendations to minimize musher fatigue and optimize performance.

**Decreasing the Risk of Sexual Assault in College Women Through Education**.

Shelby Mitchell, Undergraduate Student, HPER Department (Patricia Hogan, Faculty Advisor)

This project was deigned to show women the many risk factors of sexual assault and the ways to reduce their risk of becoming a victim.

**Celebrate Reading with a READ IN**

Daniele Morey, Auna Oman, Trish Steinbrecher and Jessica Beinlich, School of Education (Sue Szczepanski, Faculty Advisor)

Learn how NMU students made reading a family and school wide event. Learn about an evening of READ IN activities, including flashlight reading, poetry apron,book swaps, readers' theatre, and read alouds. All of the student generated ideas in this presentation promoted reading throughout the school community and carried over long after the evening was over. Our goal was to showcase reading as a priority, and create a community of parents, teachers and students who couldn't wait for this night to happen again.

**Cloning of the Region Coding for the Ectodomain of BAFF in a Bacterial Expression Vector**

Hope O'Donnell, Undergraduate Student, Department of Biology (Osvaldo Lopez, Faculty Advisor)

Protective neutralizing antibodies are rapidly induced after infection with cytopathic viruses. Abortively-infected dendritic cells (DC) induce B cells to produce these antibodies. B-activating factor (BAFF) is upregulated in infected DCs. This molecule is anchored in the membrane of DCs and interacts with TACI on B cells. We hypothesized that BAFF is involved in the activation of B cells early after infection. To test this hypothesis, we need to produce soluble BAFF to be used as antagonist in cell-cell interactions. To that end, we cloned the region coding for the ectodomain of mouse BAFF into the plasmid pTrcHisTOPO (Invitrogen(R)). This vector allows expression of the coding region of a gene in bacteria. We first determined the sequence corresponding to the ectodomain from the published sequence of the BAFF gene in mouse, extracted mRNA and amplified it by RT-PCR. Then, the amplicon of the expected size was cloned in pTrcHisTOPO and transformed into TOP10 E.coli. The orientation of the cloned gene was analyzed by restriction endonuclease digestion and sequencing. We plan to express the ectodomain of BAFF and use it in competition assays with soluble TACI-Fc to determine specific binding.

**What if a Classroom Was Run Like a Business**?

Dale Throenle, Undergraduate Student, Department of Education (Joe Lubig, Faculty Advisor)

I have spent most of my previous career path in the business world, and I have seen how efficiently a business runs when the employees are empowered with the ability to direct their efforts toward the business goals. This empowerment involves establishing combined management and employee rule sets, expected goals, and rewards for employees when goals are met.

As a future teacher, I will center my project on a question: "What if a classroom was run like a business?" The concept behind this project is to explore how to empower the students to further their education while still achieving goals set for their education.

I have chosen this topic for several reasons. One, I believe that discipline issues in the classroom exist because the students do not participate in the making of the rules. Ownership is a primary reason for success, and students do not own the rule-making effort. Two, empowered students, in my opinion, will work harder toward goals, especially if they can see a tangible reason for working toward that goal.

I will present this topic using PowerPoint presentation and a Movie Maker video to present my material.

**Evaluation of the effect of Barriers on Fish and Parasite Communities in the Miner's River in Northern Michigan**

Nicole M. White, Graduate Student, Department of Biology (Jill Leonard, Faculty Advisor)

This project examines how barriers affect fish communities and their parasite communities in Miner's River in Pictured Rocks National Lakeshore, Michigan. Fish communities were sampled by electrofishing in August and October 2005 at seven sites, above and below man-made and natural barriers, including a sea lamprey barrier, a lake, and a waterfall. I caught 1,090 fishes, representing 18 species. 68.0% of captures occured in August. Three species (rainbow trout (Oncorhynchus mykiss), coho salmon (O. keta), and splake (Salvelinus namaycush X S. fontinalis)) are exotic to the area. One species (sea lamprey (Petromyzon marinus)) is invasive to the area. The most commonly caught fishes were sculpins (Cottus spp.). The highest fish diversity was found below the sea lamprey barrier while the lowest was below the lake. For necropsy, 515 fishes were kept. Nematodes, trematodes, and copepods were present, with nematodes being the most common. Further classification of parasites is currently in progress. Of fish necropsied, 23.1% were infected with at least one species of parasite. The prevalence of black spot (Unilifer amblоplitis) in all fishes was 2.5%. It is likely that since fish communities change site to site, fish parasite communities will also vary.

POSTER PRESENTATION

**The Poisson Discrete Probability Distribution and Other Major Statistical Contributions of Simeon-Denis Poisson**

Erin Bakshis, Undergraduate Student, Department of Mathematics and Computer Science (Sujay Datta, Faculty Advisor)

This is a poster presentation outlining the significant statistical contributions of Siméon-Denis Poisson; including his discrete probability distribution and unique characteristics of the Poisson Distribution. Also included will be the Poisson ratio, Poisson regression, and the Poisson-Charlier polynomial. A brief biography will be followed by a derivation of the Poisson Distribution's mean and variance as well as raw and factorial moments using an infinite-series summation technique. There will then be a discussion of other contributions to applied statistics.

**Teaching Individualism**

Anthony Barnes, Undergraduate Student, Department of English and Geography (Joe Lubig, Faculty Advisor)

My main focus question is, "How can we teach students to become individuals without losing important information?" The poster board will be split up into a teacher centered focus on the left and a subject centered focus on the right. The middle area will be devoted to my views on the subject.

The reason I chose this topic is because I feel like too many high school students nowadays are losing touch with their individualism due to specific factors that deal with popular culture. IPods, cell phones, and teen magazines/television programs are a challenge that all teachers have to deal with now. One way to combat the typical teacher centered class that feeds into this is to teach a subject centered class, but it becomes difficult when the latter lacks coverage of other important information. I want to teach a class full of individuals who are able to see the entire picture rather than a group of lemmings controlled by outside sources without losing information. How?

College is where the rest of your life is decided. If individualism is honed at the youngest possible age, students will have a better chance to pursue what they want to do in the future, allowing for more time to make adjustments and life changing decisions. I feel like it makes more sense to help students decide what they want to do in life opposed to cramming useless information into their heads. This then becomes an issue of what needs to be taught.

**Benefits of Art Education**

Jacquelyn Biersach, Undergraduate Student, Art & Design Department (Joe Lubig, Faculty Advisor)

ART. Is it anything more than an easy A for students, or a waste of time in the eyes of our parents? Of course we know that art is a great subject for those “artsy” type, but what can it do for those who are not artistically inclined? Art in fact has numerous benefits, most of which nobody is even aware of. From test scores, your mood, to even your health, art can effect many areas of life in a very powerful way. It is important to understand these benefits so we no longer ignore the opportunities available to us, but take advantage of them. Art can not continue to be set on the back-burner and be cut from schools, but should be properly addressed as a major importance to not only the students in our schools but everyone. All the benefits of art should made aware of and utilized. What are these benefits and how can we use art to its fullest potential?

**Special Education through Service Learning by Special Education Majors**

Jessica Bruntjens, Kara Farquhar, Jeanne Johnson, Valerie Johnson, Sarah Madison, Sarah Massoglia, Danielle Morey, Melissa Moyryla, Leah Ranta, Jill Robinson, Jody Torvinen,Undergraduate Students, School of Education (Kathleen Heikkila, Faculty Advisor)

The special education seniors enrolled in methods courses decided to adopt a 'sister school' in Slidell, Louisiana which was affected by Hurricane Katrina. This year-long service project became integrated throughout their coursework and was the basis for learning both content and methodology as the seniors sent lesson plans and materials to Bayou Woods Elementary.

**A Student Teacher’s “What if’s” Concerning Cooperating Teachers**

Erin M. Cardone, Undergraduate Student, Department of Education (Joe Lubig, Faculty Advisor)

In my presentation I will ask many different questions that concern the relationship between a student teacher and a cooperating teacher. The big question is “What if I don’t get along with my cooperating teacher?” Although this is the overreaching question, I will also ask questions like “What if my cooperating teacher has different teaching methodologies than I do?” or “What if my cooperating teacher has different classroom management attitudes than I do?” On my presentation poster, I want to approach different solutions to these questions.

Through doing the research on this topic and looking at these questions, I hope to be able to learn ways of dealing with my cooperating teacher. I’m notexpecting to have these problems but I still want to know what to do if it does happen, and I’m sure that many others that are about to go into student teaching have the same or similar questions.

**Self-Assement for Teachers**

Tom Christesen, Undergraduate Student, Department of History, (Joe Lubig, Faculty Advisor)

What is the best way for a teacher to use self-assessment? How often should self-assessment be done? How does someone find out about effective ways to assess oneself? Self-assessment is very important for a teacher. It should always be a tool that a good teacher should use. But how does one get started?

Self-assessment is very important because it keeps a teacher alert to any needs that their class may have. It is important to not be too content with your teaching. It is easy to get too comfortable with your technique. A teacher may have a high success rate but they may not realize that the students are not actually “learning” very much at all. It is a mistake to only use test scores and grades as an indicator of a good teacher. Therefore self-assessment should always be on the mind of a good teacher. One should never be so proud that they can not admit that they can improve. You should always listen to advice no matter who gives it to you. You may have to be thick-skinned from time to time but the students are what is important, not your ego.

There are many ways to use self-assessment and many techniques. The web is a great place to start. But an even better place to start would be from a veteran teacher. The important thing is that you use it, use it often and use the results to better yourself thus helping your students

**Is Our Education System Setting Boys up for Failure?**
Liza C. Collins, Graduate Student, Department of Mathematics and Computer Science (Joe Lubig, Faculty Advisor)

My poster begins by focusing on the literacy of our students and how it affects students’ success in school. Research states that poor literacy can negatively affect grades in every subject. A student’s ability to read and comprehend all of the materials that are involved in the learning process, may be the most important skill a student can have in school. This is why the middle portion of my poster will focus on why boys have a much lower literacy rate than girls. Boys take longer to learn to read than girls and are also far more likely to describe themselves as “nonreaders.” While researching I have found that the curriculum tends to shun materials that boys are interesting in reading, like comic books, sports magazines, etc. Also, boys prefer to act out their responses to books instead of the normal discussion circle. The final portion of my poster will center on the curriculum and the set-up of schools. Boys are the minority on college campuses and they are less likely to succeed in school. I am going to present solutions and changes that we could make to the curriculum to create more success for boys in school.

**Students & Nutrition**
Devon N. Coluzzi, Undergraduate Student, Department of History (Joe Lubig, Faculty Advisor)

This poster presents information regarding how the nutrition of high school students will affect their ability to learn in school. There are two key aspects which are covered. The first aspect covered is how students’ nutritional deficiencies will affect their ability to learn. Side effects such as fatigue, boredom, low motivation, as well as a decrease in reading and writing skills are likely to occur in students who have been undernourished. While no school program has been able to completely fix this problem, there are many programs such as the National School Lunch Program that have been able to improve the nutrition of many students. The second aspect covers the unhealthy eating habits of high school students. It is becoming increasingly more common for high school students to munch on unhealthy snake food throughout the day rather than sit down and eat a healthy well-balanced meal at lunch time. This is due in part to the way in which schools schedule lunch hours as well as to society’s on-the-go lifestyle that is becoming more and more prevalent.

**Marquette Iron Ore Heritage Area: A Geographical Study**
John Coombs, Undergraduate Student, Department of Geography (John Anderton, Faculty Advisor)

The Iron Ore Heritage area is a proposed trail between the Marquette Lower Harbor Ore Docks and the Republic Mine in Republic Michigan. The trail will incorporate areas of interest including:
- Marquette Ore Docks
- Jackson Mine
- Morgan Furnace
- Pioneer Furnace
- Cleveland Mine
- Champion Mine
- Republic Mine

The data is comprised of historic maps from the NMU Archives as well as online sources, geologic data from the Michigan DNR, and satellite imagery from the US Geological Survey. The product is the visual geographic relationship of the proposed trail with historic sites and current features. To enhance current features, satellite imagery was layered underneath trail and feature layers. The satellite imagery was compiled using the ArcGIS program into a 3-band (red, green, blue) data set. Other data such as bedrock and quaternary geology is underlaid with the trail layer to show it's geographic relationship. All the data is combined into a map document using ESRI ArcMap.

**Yeasts, Insect Eating Fungi, Plants, and Humans: The Connection**s
Scott E. Danneman, Graduate Student, Department of Biology (Donna Becker, Faculty Advisor)

Fungi play key roles in natural systems. They recycle dead matter, break down toxic compounds, form mutualistic relationships with plants, supply food to many species, and much more. Humans have found applications of fungi in alcohol production, as food, antibiotic production (penicillin, griseofulvin, etc.) and as biocontrol agents (insecticides, fungicides, etc.). The objectives of this study were the isolation and study of yeast species from fruit and compost and the production of the insect eating fungi Beauveria bassiana and its application in the NMU greenhouses. Yeasts were isolated from wild and domestic apples as well as from a compost pile. They were purified and studied using laboratory microbiology techniques. The growth, production, and application of B. bassiana as an insect biocontrol agent were studied. Nine yeasts were isolated from apples. Two yeasts were isolated from the compost. Some of these yeast species display unusual phenotypes such as dimorphic growth, and unusal cell shapes. B. bassiana proved to be extremely effective at controlling whiteflies and mealy bugs but slightly less effective at controlling thrips and aphids in greenhouse studies. Its growth also proved to be relatively easy except for contamination issues in the cultures.

**Creating an Inclusive Native American Classroom**
Walter Dowling, Undergraduate Student, Department of English (Joe Lubig, Faculty Advisor)

This project is on creating an effective inclusive classroom for Native American students. It focuses both on ideas and methods that help the students succeed, and ideas and methods that don't work. Some aspects that are covered include embracing native culture, avoiding derogatory terminology, and altering curriculum to help challenge stereotypes. By making these alterations to classrooms teachers can both empower students as well as counteract prejudice prevalent within society. While this project focuses on mixed classrooms with both Native

American and non native students, many of the techniques are useable in a non-mixed classrooms.

**Importance of Physical Education**
Tim Edwardson, Undergraduate Student, HPER Department (Joe Lubig, Faculty Advisor)

In this project I will be focusing on the importance of Physical Education in school curriculum. Physical Education is a very sensitive subject in school today. The importance of the class is often over looked. Curriculums are becoming more and more Math and English oriented and leaving other important classes out. The project will focus on the fitness level of the students in America today and how a Physical Education program can improve the health of the youth. The other section of the project will focus on the skill levels of students in Physical Education verse students that do not have one.

The Information that I will use to show the skill level of students will be information I attained through a study at Father Marquette. The project will look at the other effects of a physically fit student besides their fitness levels. As a future physical educator I see the importance of this class and really want to share it with others. A Physical Education program is a very important aspect for developing a complete student.

**Respect and the Classroom Environment**
Shannon S. Fisher, Undergraduate Student, Department of Chemistry (Joe Lubig, Faculty Advisor)

One of the aspects of becoming a teacher that excites me is creating the optimum classroom environment. I want my classroom to be comfortable, welcoming, inspiring, and I want my students to feel safe. To achieve this ideal atmosphere, the management of my classroom must be sound and secure. While I plan on interacting with high school students on a day to day basis, I do expect to establish mutual respect between my students and me. I will do my very best to show respect for each of my students by valuing them as individuals in and out of the classroom. But am I being naïve with my expectation of the return of respect from my students? Some of my students may enter my classroom with having ever been respected before. How will they know what respect feels like, and how to give it? Is respect something that can be taught?

**Pop Fiction, Classic Literature, and Young Adult Lit: An Exploration**
Katherine Gagno, Graduate Student, Department of English (Joe Lubig, Faculty Advisor)

My paper will attempt to explore the differences between pop fiction, classic literature and young adult literature and which of these I would like to teach in a class. Classic lit requires more effort for both teachers and students. The easy solution or compromise seems to be to perhaps “partner” the books; that is read a classic with another more modern book. Through this option you supplementing rather than substituting.

One of the issues I wish to explore when looking at non-classic literature are whether it is beneficial to learn about teen angst and ignore the larger human condition—as favored by newer poppier novels? Or are we ultimately harming the students by allowing them to take shortcuts? And what is the purpose of the shortcuts? Just to get them to read anything at all? Is good writing more important?

I personally believe that the classics are worth the effort but I do wonder whether that is a somewhat stubborn way to look at things. Which is why I would like to explore what students are reading, how they feel about it and what they could potentially be reading.

**The Effects of Delayed High School School Start Time**

Jessica George, Graduate Student, HPER Department (Joe Lubig, Faculty Advisor)

An abundance of studies show that high school students would benefit from a later start to the school day. Then why have only a couple of districts adopted a delayed school start time? If the benefits are known then what is holding the rest of the country back from following in the footsteps of these select districts. The drawbacks must overwhelm the advantages if a later school start time for high school has not become the norm. The center of this debate should be the students not bus schedules.

**Physical Activity and Its Influence Academic Performance**

Ashley Hanttula, Undergraduate Student, HPER Department (Joe Lubig, Faculty Advisor)

Physical activity and nutrition are the hot topics lately. News headlines such as these are not just for the adults. Our nation’s children are becoming overweight, developing “adult” diseases, becoming increasingly less physically active, and are sedentary at school.

We want our children to be healthy, physically fit, and do well academically to keep up with our American society, so why are we are taking away recess time, allowing less time for lunch, and decreasing physical education classes at all levels? What is the real cause of this epidemic seen first hand in our students - our children?

I am concerned that students are having less opportunity to be physically active which is having a detrimental effect on developing their basic motor skills that will enhance students academically.

A number of studies have proven that when student’s fitness needs are met, they are more able to learn and achieve. Given the growing epidemic of obesity and the link between physical activity and academic performance, parents and schools must work together to make quality daily physical education a priority in our schools and to give our children more opportunities to be physically active throughout the school day.

**Getting Involved**

Mark Henrion, Undergraduate Student, Department of Mathematics/Computer Science (Joe Lubig, Faculty Advisor)

Extracurricular activities empower teachers with an entirely new teaching platform. Teamwork, cooperation, discipline, time management, and sacrifice are learned through extracurricular activities while students build lasting friendships with teachers and peers. Countless students drudge through elementary, middle, and high school feeling unwanted, uninvolved, and perhaps even uninvited into the community that surrounds their school. Educating young people goes far beyond the classroom. Often it is the lessons learned from daily, firsthand experiences that remain with students forever. Getting every student to feel like a member of the school community is crucial to the mental, physical, social, and emotional health of the kids we as teachers will encounter on a daily basis. While some schools lack funding for high profile extracurricular activities such as sports, band, or various academic clubs, teachers still have the power to impact their students outside of the classroom. Anything from an after-school soccer league to a lunchtime book club can become ways for students to learn from teachers and fellow students in a personal, informal setting. Imagine the possibilities if every student in America had an endeavor that was personally and truly meaningful, enjoyable, and motivational.

**Many Masks of Teachers**
Anna Herman, Undergraduate Student, HPER Department (Joe Lubig, Faculty Advisor)

As teachers we take on many different roles in our work or wear different masks everyday. Our job description should say something like ready to take on many jobs, roles, people and situations. Teachers must be versatile people, ready to act on the spur of a moment and make good decisions. It will not only involve teaching but wearing many masks, sometimes more than one and having many responsibilities.

In this project I plan to discuss the different roles or masks that teachers take on or wear in their daily endeavors. I feel we act as parents, coaches, gardeners, miners and jazz musicians, thorough our teaching. I will depict how we take on these roles as it is related to education and teaching the future youth of America.

**The Importance of Sleep in Education**
Lesley R. Hicks, Undergraduate Student, Department of Mathematics (Joe Lubig, Faculty Advisor)

This is an investigation of sleep among school-aged adolescents and their academic performance, and cognitive and achievement tests. Research has revealed a high prevalence among school-aged adolescents of suboptimal amounts of sleep and poor sleep quality. Research demonstrates that suboptimal sleep affects how well students are able to learn and how it may adversely affect school performance. Early start times for schools, extracurricular activities, homework, and social life affect students' sleep, which often means falling asleep during school. This investigation will provide students and teachers with solutions to this problem; because in a perfect school students and teachers would be alert and ready to learn.

**You Got Your Teaching Degree, Now What?**
Janelle Hill, Undergraduate Student, History Department (Joe Lubig, Faculty Advisor)

My project will be titled, "You got your Teaching degree, now what?" My project will cover the aspects of searching for a job after you get your teaching degree. My focus will pertain to how to search for teaching jobs around the United States with some other references on how to find teaching jobs abroad. There will be a map of the United States that will be keyed on where the high demand areas are for teaching jobs. Part of the project will have examples of different kinds of applications that future teachers will have to fill out. There will be a page on how to write a professional resume' that would be appropriate for future educators seeking a job in teaching, with an example resume'. Another part of the presentation will include teaching fairs in different areas in the mid-west. I am also trying to get information from school districts that have a great need for educators, such as Las Vegas and different areas of California and Alaska.

There will be handouts that can be taken on "How to write an Education Resume with an example resume attached," "Where to Look for a Job," and "Resources."

**Math Beyond the Textbook**
Lindsay Hilliard, Undergraduate Student, Department of Mathematics (Joe Lubig, Faculty Advisor)

This display contains resources for math educators. Books, websites, television, and movies are used to show that there is more to math than what the textbook offers. Most importantly, this display gives suggestions as to how to implement these new strategies in the fast-paced, curriculum-tethered classroom. Secondary mathematics classrooms are plagued with students who claim to loathe math and don't see the point. My belief is that by referencing other sources and including more student-focused material in the traditional mathematics classroom, new interest will spark in what most American students identify as their least favorite subject.

**A New Generation of Physical Education**
Jennifer Holsworth, Undergraduate Student, HPER Department (Joe Lubig, Faculty Advisor)

The amount of physical activity children get in and out of schools has declined in recent years. More and more young people have become more overweight and less fit. Participation in all types of physical activity significantly declines as age or school grade increases. This shows that there needs to be a new approach to physical education. There needs to be an increase in overall physical education in schools, and a greater emphasis should be placed on lifelong fitness activities. Physical education classes should be made a higher priority in all schools. Classes should be longer, more frequent, and more realistic. Not only do the benefits of physical education affect the physical activity pattern of students, but they also affect academic learning. Physical education needs to start living up to its name, and we need to enter a new generation of physical education.

**ADD Overmedicated and Overdiagnosed**
Jason Houle, Undergraduate Student, Department of Science (Joe Lubig, Faculty Advisor)

ADD is a neurological dysfunction in the prefrontal cortex of the brain. There is a chemical imbalance that occurs with ADD. I just read an article that said one in four people are now being diagnosed with a brain disorder. These disorders include emotional disorders, mental disorders and ADD. ADD I believe is becoming a real problem in our schools. More and more kids are being diagnosed and medicated very quickly, with the majority of them not every seeing a psychiatrist. If this is a mental disorder why are the children not seeing a psychiatrist? It seems that we are trying to fix our kids with chemistry. The chemistry is my biggest concern; a good number of these children being diagnosed with ADD are selling their prescriptions at school. The worst part is that school officials can't tell who is taking their medication and who is selling it, which brings up the question is it just a quick fix to a more complex problem.

**Preparing for Teaching Overseas**
Jason Howes, Undergraduate Student, Department of Mathematics and Computer Science (Joe Lubig, Faculty Advisor)

One of the main reasons I went into teaching was for the opportunity to teach and live in other countries. In eighteen very short months I will be on the market looking for jobs, and I have very little or no idea how exactly one gets hired in an overseas school. Obviously sending a resume via email has become quite easy, but I have heard of placement agencies, and seen online services devoted to help one get hired overseas. Do these really work? Some schools are more competitive to get into than others. Are there things I could be doing right now to make myself a better candidate? Should I work in the United States first before going over seas? What steps do I need to take as I approach graduation to prepare myself for getting a job in a foreign country? These are just a few of the questions I would like to look into. Although graduation seems a long ways away, I know it will be here soon and answers to the above questions will be extremely useful when the time comes.

**Critical Thinking**

Meghan Ivory, Graduate Student, HPER Department (Joe Lubig, Faculty Advisor)

Critical thinking is currently a “buzz” word in education. What is critical thinking? My impression of critical thinking is knowing how to retrieve and interpret the information available for making decisions. Is critical thinking merely “common sense”? How can we teach students so they possess the critical thinking skills they need to succeed in LIFE? Is EMPOWERMENT the key?

Teaching students about making decisions is not only an essential skill they need when they are finished with their education; they need critical thinking skills while they are still getting their education. Critical thinking applies in all areas of life from choosing a health insurance plan to deciding what to eat for dinner.

I think critical thinking is an important topic for educators because today’s youth seems to be lacking in “common sense.” I worked with high school and college aged students for several years before returning to school to pursue a teaching certificate. My goal with those students was to have them make decisions if I wasn’t available. I hope to bring critical thinking into the classroom so students will have the confidence and skills they need to make appropriate decisions for themselves.

**The Democratic Classroom**

Michael Jensen, Undergraduate Student, Department of Mathematics and Computer Science (Joe Lubig, Faculty Advisor)

As a soon-to-be educator, one of the most daunting and intimidating tasks, as I see it, is managing my active classroom. My research is focused on the theories behind a democratic, student-lead classroom, how to implement it, and the advantages of using this technique with the students. The main ideas behind the democratic classroom are to enhance student involvement and cooperation as well as establish a positive working environment. Implementing this type of classroom is important because it has been shown to help students take more of a leadership role both inside and outside the classroom.

**When Do Calculators Add Up?**

Kenneth Johnson, Undergraduate Student, Department of Education (Joe Lubig, Faculty Advisor)

There is a philosophical war in mathematics that concerns the use of calculators in the classroom. The intention of this presentation is to identify the benefits and concerns from each side of the debate, and then provide strategies that address the arguments from each side. To this end, the National Council of Teachers of Mathematics Curriculum and Evaluation Standards position will be outline, as well as the responsive positions from classroom educators and collegiate researchers. To highlight the position of current local middle school students, several quotes and pieces of data from a personally conducted survey will be displayed. Finally, strategies devised by classroom teachers and collegiate researchers will be compiled and listed to provide the reader several options for integration of calculators.

**Mycological Techniques, Applications, and Benefits: A Review**

Kevin Jorgensen, Graduate Student, Department of Biology (Donna Becker, Faculty Advisor)

Mycology, the study of fungi, is a growing field in biology. Although fungi may be notorious for being poisonous and spoiling food, scientists are learning about the many useful applications and benefits of fungi. These include: fungi as a novel source of protein and nutrition, medicinal benefits, improved plant growth through mutualistc associations with the plant's roots, applications for remediation of agricultural and industrial wastes, and potential uses for remediation of polluted areas. The objectives of this study were obtain pure cultures and fruit different fungi species on a wide variety of substrates using microbiological techniques. Pleurotus ostreatus (Oyster mushroom) and Lentinula edodes (Shitake mushroom) were two species of interest. Each was obtained as spawn and fruited on a variety of substrates including: paper, coffee grounds, sawdust, wheat straw and nitrogen supplemented versions of each. The Pleurotus species served to be the most vigorous and least preferential of conditions or substrate. Wood based substrates worked the best for both species, but using waste products such as coffee grounds were cheaper (free) and still effective. Tissue clones of local fungi Pleurotus ostreatus, Herecium, and Auricularia were isolated for future use. Developing methods and techinques to limit contamination have been crucial.

**The Reasons to be a Teacher**

Julie Kaukola, Undergraduate Student, Department of History (Joe Lubig, Faculty Advisor)

Why do teachers decide to become teachers? Were they influenced by their family or friends? Perhaps they had a great teacher during school that influenced their decision to be a teacher. Some may come from a long line of teachers and it was only natural to become a teacher. Still others may just want holidays and summers off. There are many reasons why teachers become teachers. The reason a person becomes a teachers may be directly correlated to whether or not they are effective teachers.

I know my family had a huge influence on my decision to become a teachers and I wonder what influenced others to become teachers. What makes people want to be teachers? Does it have an affect on whether they are good teachers? It may be a matter of opinion but I think if a person has a good reason for become a teacher they will be a good teacher. If they just want summers off and a regular schedule then I don't think that makes a good teacher. They should want to teach, not have vacation.

**Men Have It Tougher! Psychology Students' Attitudes and Certainty toward Gender Socialization Pressures during a Structured Controversy**

Anna Tippen Kerr, Undergraduate Student, Education Department, (Judith Puncochar, Faculty Advisor)

Eighty-seven Psychology 100S participants engaged in a structured controversy on USA gender issues, "Who Has It Tougher – Females or Males?" During structured controversy, participants argue for both sides of an issue. Following perspective-taking, women shifted their attitudes toward "Males Have It Tougher," and reported high certainty in their opinions. Likewise, men shifted toward "Males Have It Tougher," but men exited the controversy less confident in their opinions than before they started. The decrease in men's certainty is interesting because undergraduate males reported higher rates of certainty in college classrooms, even when wrong (Lundeberg, Fox, & Puncochar, 1994). Possible explanations are: (1) men might have had to hold more information in working memory than women (e.g., "fan effect" by McGuire & Maki, 2001), or (2) the larger number of women in the study could have influenced men's lower post-controversy certainty and women's higher post-controversy certainty. Five of eighteen groups reached a decision that "Males Have It Tougher." We report reactions to the question, "I would live in this society in the body of my opposite gender if I could."

**Reaching Reluctant Readers**

Rebecca Keyes, Graduate STudent, Department of English (Joe Lubig, Faculty Advisor)

There are many different types of reluctant readers—uncommitted, unmotivated, unskilled—but this project will focus on young adult readers who are alliterate—those who have the ability to read but for various reasons choose not to. This project seeks to understand why some students choose not to read and what teachers can do to try to reach and motivate these students in a secondary classroom setting with the acknowledgment that not all suggestions will work for everyone. However, this project will also present and examine the best practices and materials for reaching reluctant readers based on findings from recent scholarship. The effort of trying to reach reluctant readers is important because reading is a necessary and vital skill to have not only for study and learning in school, but also for life.

**The Effects of Labels and Stereotypes in Today's Classroom**

Jennifer Knisely, Undergraduate Student, School of Education (Joe Lubig, Faculty Advisor)

Labels and stereotypes can have a powerful effect in the lives of students in today's schools. Students in special education programs are especially prone to the effects of labels and stereotypes. I am going to do my project on the effects of labels and stereotypes in the classroom. This is a topic that I find very interesting and I hope that by researching it more I can prevent the use of labels and stereotypes in my own classroom.

I chose to research this topic further after observing one of my fellow employees during a conversation and how the labels placed on him had affected his thinking regarding the English class he was in.

I am going to use a tri-fold poster board to present with my research, ideas, graphs/charts and pictures.

**Competition in the Classroom**
Ryan Kuntz, Undergraduate Student, Department of History (Joe Lubig, Faculty Advisor)

Competition is a very interesting thing. It raises emotions and energy, and can bring out the best and worst in everybody. Some people are seemingly immune to it and not competitive in the least, while others turn something as simple as a board game into seemingly a matter of life and death. I have been a very competitive person my entire life, and I have always wondered how one can incorporate competitiveness into their teaching methods most appropriately. What are some ways to use competitive games or projects while also appealing to those who are not competitive at all? How do you know when something gets too competitive and you have to draw the line? These kinds of questions intrigue me and made me want to look deeper into this idea of competition in the classroom. To come to a conclusion, I will consult a few different sources and sprinkle in my own ideas. Hopefully, I will get a clearer picture of how competition in a classroom is supposed to look.

**Philosophy of Great Teaching**
Matt LePage, Undergraduate Student, Department of Education (Joe Lubig, Faculty Advisor)

Teaching is a profession that requires an array of personal talent. Great teachers must be dedicated, determined, organized, motivated, enthusiastic, and most importantly teach and lead by example. Teachers have an enormous effect on their students and the way they develop character, confidence, and creativity. Teaching may have a positive or negative effect, but the bottom line is teachers have the ability or inability to influence their students. The main question many of us future teachers are: how do these great things happen? How does IT happen? How do teachers obtain it? Is it easy to get? Is it hard to get? Do some teachers never get it? For my final project, I've decided to take an in-depth look at what IT is. I've interviewed several professionals in the teaching field along with some students. I've decided to compare the answers of the two views and then create a poster that correlates the two sides. Questions that will be answered on the poster are: Are their similarities between the two sides? Or, is their a huge difference in opinion?

**Assessment of Aquatic Macrophytes on E. coli Concentrations at Recreational Beaches**
Mary-Cathrine Leewis, Graduate Student, Department of Biology

The indicator organism used in beach monitoring for most Great Lakes is Escherichia coli, as high levels of this organism have been correlated with recent fecal contamination events. These events may contain other, more pathogenic, bacteria and pose a risk to human health. Another serious problem at many beaches are stands of aquatic macrophytes (e.g. Eurasian Water-Milfoil). It has been recently hypothesized that these stands may harbor high concentrations of E. coli, in a similar manner to the green alga Cladophora, and allow for the proliferation of these indicator bacteria. The objective of this project was to assess the relationship between amounts of aquatic macrophytes and amounts and persistence of the fecal indicator organism, E. coli in beach water. Four inland lakes with high tourist activity were selected. A defined substrate test (Colisure®, IDEXX, Inc.) was used for enumeration of E. coli. The relative amount of aquatic macrophytes also was determined at each location via a subjective scale (0 to 4). This project examines the relationship between aquatic macrophytes and E. coli concentrations at the same locations. This study will assist in determining if E. coli is an appropriate indicator of recent fecal contamination of water in situations of elevated levels of aquatic macrophytes.

**Test Anxiety: An Instructional Plan for Informing Teachers**

Naomi Lieber, Undergraduate Student, Department of Political Science (Joe Lubig, Faculty Advisor)

Test anxiety frequently goes unrecognized and students that have the disorder are too often left to fend for themselves on tests. Teachers are also under-educated about the issue and have trouble effectively combating test anxiety in their students. Because of this I have assembled an instructional program that can be used to educate teachers about test anxiety. The program gives background information on test anxiety and discusses the research about the causes of the disorder. The program also contains information about what teachers, administrators, parents and students can do to combat test anxiety. These include strategies to improve students' abilities to study, and strategies that will specifically help them combat anxiety during testing.

**Urban Education**

Kimberly Lippke, Undergraduate Student, Department of Political Science (Joe Lubig, Faculty Advisor)

While there are 16,850 public school districts in the United States, one hundred of the largest urban school districts serve nearly one-fourth (23%) of all public school students in the country. These districts also serve 40% of the country's minority students and 30% of the economically disadvantaged students. The goal of educators is to be sure that all students receive high-quality educations, achieve at admirable levels, and complete high school equipped with the knowledge and skills needed for further education or entry-level employment. It is sufficient to note that schooling practices have mainly failed to meet the learning needs of urban minority students and that reversing this pattern is significantly important—for the students themselves, of course, but also for the social and economic health of the nation. The purpose of this project is to explain, through quality research, effective practices for educating urban minority group students-in light of what the general effective teaching research has to say-which lead to positive outcomes for all students in general. The project will also detail some schooling practices that, although implemented to improve student performance, ultimately delay instead of improve student achievement.

**Using Isothermal Titration Calorimetry to Examine the Effects of pH on the Binding of Trypsin to α2-macroglobulin**

Stacey MacNeil, Graduate Student, Chemistry Department (Suzanne Williams, Faculty Advisor)

Isothermal titration calorimetry (ITC) was used to investigate the binding of trypsin, a serine protease, to the human plasma protease inhibitor, α2-macroglobulin (α2M). α2M is an important molecule to study because of its ability to regulate proteases and growth factors in plasma. Some data suggest α2M may be involved in Alzheimer's disease.

Binding interactions between α2M and trypsin were studied at three different pH conditions (7.4, 8.0 and 9.0). Under normal conditions, pH 7, one molecule of trypsin binds to every molecule of α2M. However, as pH increased, an interesting phenomenon was observed as the number of binding sites in the interaction appears to change from one to two as two distinct plateaus in energy are observed throughout the titration. The binding stoichiometries and energetics, however, remain the same as pH is increased. The data suggest that with increased pH, there is a change in the way α2M traps trypsin, but the overall energy associated with the process does not change.

Our working hypothesis about the effect of pH on binding is that at higher pH values, α2M is more unfolded, and therefore more accessible to binding by protease enzymes such as trypsin.

**Preparation of the Coumaran Skeleton By Radical Cyclization**
Mallory Mahoney, Undergraduate Student, Chemistry Department (Frankie McCormick, Faculty Advisor)

Carbon radicals can be used to form complex carbon skeletons through cyclization reactions. The current method is to use tin hydride to generate the carbon radical from an organobromide. This is undesirable for two reasons. First, there is the potential that toxic tin can be left within the products making them unusable. It is also very difficult to dispose of tin in an environmentally safe way. These cyclization reactions are important because they could be used in the pharmaceutical industry to produce medicines. The reaction that I have studied converts o-allylbromobenzene to 2,3-dihydro-2-methylbenzofuran, a coumaran, using polarity reversal catalysis. In this reaction, triisoproplysilane and 2-ethyl-3-pentane thiol are used as replacements for tin hydride. I will discuss the methodology and gas chromatogtaphic analyses used to study this reaction.

**Real-time Object Recognition in a Vision System for a Pool Playing Robot**
David Manor, Undergraduate Student, Math/Computer Science Department (Jeff Horn, Faculty Advisor)

Using a video camera interface, an image of a pool table, or section of a pool table, is taken and loaded into a Java program. The program runs an image searching algorithm to pick out the different colored pool balls currently on the table and the location of each one.

**Poor Eating Habits and Students' Performance**
Michelle Moard, Undergraduate Student, Department of Mathematics (Joe Lubig, Faculty Advisor)

We all know that a healthy lifestyle can lessen someone's chance of serious illness, extend someone's life, and enhance their wellbeing. But I wanted to know how a poor lifestyle, specifically poor eating habits, can hinder a student's performance in the classroom.

As a future educator, I have had plenty of time to figure out which rules in my classroom I am planning to implement. I sometimes find it difficult since I have no experience, just theories. I have decided that one of the rules in my classroom is that as long as it does not hinder the student him/her self or the students around him/her to learn or me to teach, I have no problem with the student eating in my classroom…with one exception- the food must be healthy.

In my research, I found out how specific foods can hurt a students' performance in the classroom. I researched the abundance of sugar/carbohydrates in common, acceptable "snack foods" such as fruit snacks, fruit roll ups and pretzels. I researched the amount of carbonated beverage, aka "soda," our youth is drinking and the horrible affects they have. This way, I can effectively define the word healthy.

**Baye's Theorem**
Diana Moyle, Undergraduate Student, Mathematics Department (Sujay Datta, Faculty Advisor)

The Baye's Theorem is a useful tool to find probabilities in statistics. For finding probabilities, it is easier to use Baye's Rule in some situations. Baye's Rule uses conditional probabilities to calculate the desired probability directly. I will include a brief history of how the Baye's Theorem originated, how it can be derived, and then apply the theorem to a real-life situation.

**Nordwald Creek Baseline Study**
Tasha Niemi, Undergraduate Student, Department of Biology (Jill Leonard, Faculty Advisor)

Nordwald Creek is a small stream west of Marquette, MI. An environmental baseline study was conducted during the 2005 field season. Collected data included fish and macroinvertebrate abundance, water and air temperatures, water velocity, channel depth, wetted width, dissolved oxygen, pH, substrate composition, phosphate and chloride levels, woody debris and pool numbers. The sites include roads, railroad crossings, confluences, and footbridges. Sand makes up the largest percent of substrate in the stream. Site 5 has the greatest number of wood pieces in the stream. Site 4 has the largest number of pools in the stream. Mean water temperatures were the highest during July and velocity was steady throughout the summer. The wetted width changed little over the summer months. Phosphorus levels were low and pH ranged from 7.6 to 8.5. May's conductivity average was 0.58 µS. Site 4 (directly below Highway 41) had higher levels of chloride than the other sites. The dissolved oxygen levels were significantly different for each site in May and September. More than nine different orders of macroinvertebrates were discovered in the stream. Hemiptera, Oligochaeta, and Trichoptera were the most dominant. Brook trout (Salvelinus fontinalis) were the majority of the fish caught, and sizes ranged from 23 mm to 256 mm. Overall, the trout were larger farther upstream.

**Improving Low Income Education Systems in Regards to Textbooks**
Matthew Nord, Undergraduate Student, Department of History. (Joe Lubig, Faculty Advisor)

I am going to be making a presentation on the improvement of low income education, in particularly with textbooks. I feel that one of the biggest problems in the American education system is the imbalance in the quality of facilities, books, teachers, and the education in general, in low income communities. They continue to have to use out of date books and obsolete technology. There are many studies that show the huge difference in funding between schools of high and low income school districts.
I feel that although there is a long way to go towards the improvement of this problem, many steps are being made to improve the situation. There are grants and initiatives being made to raise money to improve the quality of low income schools. Some schools are trying to come up with different ideas to alleviate the problem of poor quality texts. They are trying to implement other types of content like magazines, the internet, and other cheaper variations of books. I feel

that it is extremely important that we give every child in America the chance to a quality education.  Lack of funding should not prevent these kids from reaching their academic potential.

**Jensen's Inequality**

Grace O'Brien, Undergraduate Student, Department of Mathematics (Sujay Datta, Faculty Advisor)

This poster presentation will be about the history, applications, and theory behind Jensen's inequality.  Jensen's inequality shows us that for a real-valued random variable with E(|X|) finite and the function g() is convex, then E[g(X)] >= g(E[X]).  One of the applications of this inequality is that E[X2] >= (E[X])2.  The difference between these is the variance, and has shown that for any random variable where E(X^2)  is finite then the variable has a variance and a mean.  Another application is based on probability.

**How Does Music Affect Intelligence?: An Analysis**

Jessica Oettinger, Undergraduate Student, Department of Music (Joe Lubig, Faculty Advisor)

Studies have been conducted to find a relationship between music and an individual's intelligence level.  The most prominent of these studies is the study of the Mozart Effect, conducted primarily by Frances H. Rauscher and Gordon Shaw.  The Mozart Effect generally claims that music can make you smarter.

Howard Gardner developed a theory about intelligence in 1983.  His theory suggests that there are a number of distinct forms of intelligence that each individual possesses in varying degrees. These types of intelligence include the following: linguistic ("word smart"), logical-mathematical ("number/reasoning smart"), spatial ("picture smart"), bodily-kinesthetic ("body smart"), musical ("music smart"), interpersonal ("people smart") and intrapersonal ("self smart").  Studies have been conducted finding links between music and each of these different forms of intelligence.

In my research, I would like to find out how the brain is affected by music and what types of physiological differences children who are exposed to music have with respect to those who are not exposed to music.  Since I am studying to be a music educator I would like to know what I can do to help enrich students' minds and their hearts.

**Transgender Youth Inclusion and Support in the Secondary Education Classroom**

Shawn O'Neil, Undergraduate Student, School of Education/English Department (Joe Lubig, Faculty Advisor)

According to the 1999 Massachusetts Youth Risk Behavior Survey, transgender youth are "three times more likely to skip school" because they feel 'unsafe', and "three times more likely to be threatened or injured with a weapon at school." This startling evidence, confirming the findings of an earlier Vermont survey, also found that transgender youth are four times more likely to commit suicide than their peers. (2002: Higgins & White, A Silent Crisis)
Even guides on how to deal with issues of bullying and harassment are prone to forgetting the issue of transgender youth. Many teachers, according to a 2001 GLSEN report, believe that transgender youth do not exist in their district, despite evidence that approximately 3% of the general population have issues with gender dysphoria. The problem is that transgender students

feel uncomfortable broaching the topic of their gender identity disorder to ANYONE, fearing rejection and violence. Trans* youth are not given any positive role models in our school systems, and generally have no support network.
For these reasons and more, this project encapsulate the transgender youth experience, and give educators and administrators meaningful suggestions on how to be more trans*-inclusive and trans*-positive.

**Teaching Evolution**
Amber Paulson, Undergraduate Student, Department of Mathematics (Joe Lubig, Faculty Advisor)

The teaching of evolution has been a controversial issue in education. Many parents do not want their kids to learn about evolution, and it's sad that some schools do not teach it to make these parents happy. Most science teachers want to teach the theory with the best scientific evidence supporting the theory. That is their job. That is what they have been taught to do.

A sample of an evolution lesson is given. It points out that the teacher states that no one theory has been proven, but that the lesson will be about the theory based on science. Along with the lesson, is a chart stating how many teachers, in the Minneapolis area, teach evolution in their classroom and what theory they teach. Minneapolis was used as an example because of their standards allowing them to teach evolution, but other states stand on the subject are also described with some historical background.

**The Importance of Physical Education**
Scott Pietila, Undergraduate Student, History Department (Joe Lubig, Faculty Advisor)

This inquiry project focuses on the importance of Physical Education in a school's curriculum. With the rising health costs in America today, teaching physical education as a life long activity can help today's students maintain a healthy lifestyle. Approximately 70% of American adults are living a sedentary lifestyle (less than 30 minutes of physical activity a day). A sedentary lifestyle has many health risks including heart disease, Type II diabetes, and obesity. These and other diseases can be reduced by simply exercising and eating healthy. Children's recreational activities will be examined to determine how much time children spend participating in physical activities and exercises. By recognizing the importance of physical education our schools can teach and prepare students to live an active and healthy life.

**Industrial Education Interships**
Steve Poindexter, Graduate Student, Department of Education (Joe Lubig, Faculty Advisor)

In my presentation I will discuss the lack of many schools' abilities to offer an adequate auto mechanics class. In the last twenty years the automotive technology has progressed so fast that many schools do not have the means - be it cost, space or lack of qualified teachers - to allow students the opportunity to go straight from the high school to the work force.

I will conduct interviews with local teachers, principles, and area car dealership service managers. My goal is to develop a way for students to once again receive proper training with the tools and equipment that today's cars use.

My idea is to allow seniors who have shown the ability to learn as much as the high school can offer a chance to internship at a local dealership. At this internship they will not just wash cars and do oil changes, the student will be right in there working with a mechanic learning what it takes to be a good mechanic in the age of computerized cars.

**Building a Community of Learners by Rebecca Novick: A Review**

Brian Prill, Undergraduate Student, Languages Department (Joe Lubig, Faculty Advisor)

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|---|---|
| Article: | Many Paths to Literacy: Language, Literature, and Learning in the Primary |
| Classroom: | Creating Communities of Learning and Excellence |
| Author: | Novick, Rebecca |
| Publication: | U.S; Oregon; 2002-03-00 |

One of the most important aspects of the education process is the face-to-face interaction between children and adults. These interactions and conversations are the process of adjustment and adaptation which are essential to building classroom community. Test scores and other assessment techniques are but only blurry snapshots of this process. The overall grading scale of a student's success or failure can be judged only by their lifetime performance.

Traditionally, schools have separated children's academic achievement from social and emotional development when in fact these often play a key role in a student's academic achievement. Schools can foster a student's competency by creating caring classroom communities which support learning by all.

There are many dimensions of building a classroom community. Within the entire community there must be a supportive and stable relationship to aid the student's growth as individuals with dialog between parents and teachers. The learning process must be constructed catering to children's natural desires and talents. The curriculum must be important and challenging being driven by long term goals rather than short-term coverage concerns. And we as educators need to provide lesson plans which are intrinsically motivational, helping students value what they learn and keep them yearning for more.

**The Weight Debate**

Courtney Pryor, Undergraduate Student, Department of English (Joe Lubig, Faculty Advisor)

What are weighted grades, and why should or shouldn't schools use this system? Many people are beginning to feel that grades should be weighted. In other words, students taking more advanced classes like physics, calculus, and even AP classes should have more significance than lower level classes such as home economics and lower level math and science classes.

Students in these higher level classes often become frustrated when they are competing for such things like class valedictorian against students who have achieved good grades, but in the less challenging classes.However, what if these students in these lower level classes struggle to get good grades in these lower level classes? Should grades still be weighted? This is an ongoing debate and it is even more of a debate as to whether or not this system would be fair. My presentation hopes to examine both sides of this argument and hopes to shed some light on what this system is all about.

**Particle Image Velocimetry Method for a Cloud Experiement Involving a Turbulence Chamber**

John Puckett, J.P. Fugal, R.A. Shaw, Physics Department (Robert Shaw, Michigan Tech University, Faculty Advisor)

Particle Image Velocimetry (PIV) is a well established method for studying turbulent flow. Cloud dynamics are best studied by observation of the clouds themselves, except that the experiments cannot be duplicated because the statistics are neither repeatable nor controllable. In other words, every cloud is unique. To resolve this, a pseudo cloud simulation is done inside a Turbulence Chamber, where the parameters can be controlled, and the responses to these parameters checked. From that, we can get an idea of what to look for in clouds. One of the more important parameters is turbulence. Turbulence in the chamber can be studied using PIV. PIV involves three basic apparatus: an aerosol generator, a camera (CCD), and a laser. PIV was studied to test the equipment to be used in the experiment involving the chamber itself. PIV essentially tells us the statistics of the turbulence in an aerosol flow. It is useful to characterize the turbulence so that it is known what type of turbulence the particles are interacting with.

**Technology Innovations in the Classroom**

Michael Randell, Undergraduate Student, Department of Industrial Technology (Joe Lubig, Faculty Advisor)

With the amount of time students from the ages of 8-18 spend on electronic media schools, communities, and students need to work together on how modern technology should be used and incorporated into classrooms. Teachers need to utilize the different technologies available, especially if their students are comfortable using the different technological innovations. Instead of banning the use of the innovations such as cell phones, iPods, etc. in the classroom why not incorporate these innovations in a manor that is suitable for a classroom or a learning tool. Like the old saying goes, “If you can’t beat them, join them.” The students are not the ones to be concerned about, they are the ones who are the most comfortable using the new technologies and learn to use the programs properly. It is the faculty/staff and parents which makes the difference. A school district which has a supportive community and administration that is willing to lead the school into technologies of the 21st century, new technologies and teaching techniques dealing with the technologies will flourish. Today, most classrooms do not allow the use of cell phones or iPods etc. It is a continual argument for teacher to confiscate these items in the classroom. In every school students are seen wearing head-phones, talking on cell phones and other electronic media every day. Why not put this trend to work in the classroom? With the use of iPods a teacher could conduct lectures and download the lecture onto the iPod. Cell phones could be used to text messages back and forth between students discussing a chapter in a book. There are unlimited ways a teacher could integrate these innovations into a classroom and use it as a learning tool. This idea of making use of the distractions into learning tools is a long-term dilemma that will not be solved immediately and brings about many questions. Questions such as:

Where will the funding come from?
What cuts will be made to bring in these innovations?
How far is a school willing to go?
What are the consequences or results?
iPods have enough memory for a whole text book, will school get rid of text

books?

**A Democratic Educational Experience**
Benjamin Redes, Undergraduate Student, Department of English (Joe Lubig, Faculty Advisor)

My project is an exploration into democratic schools. I plan on designing my own democratic school based on research I've done on them, and explaining what I would do and why. The basic premise behind the democratic school will be given. What are the roles of teachers, parents, and each individual student? What are the rules, who makes them, and who enforces them? I will design a building for the school, set the age levels, explain the class setup, and the requirements for graduation. The number of students and teachers will be suggested for my model school, and a possible daily schedule of a student at the school. Since individually driven studies is key to democratic schools, I will try to impress that the sky is the limit on what an individual can and will learn at the school. Along with this, a list of resources for the information I have found will be included.

**Awareness of Teaching Dispositions by Premethods**
LeAnn Saarela, Graduate Student, School of Education (Judith Puncochar, Faculty Advisor)

One purpose of teacher preparation programs is to help beginning teachers develop an attitude of mind for the value of teaching and learning, referred to as teacher dispositions. The objective of this descriptive research was to examine NMU pre-methods education students' awareness for teacher dispositions. Participants were members of a foundational education course called "Teaching & Learning in the Secondary Classroom." By the end of this course, pre-methods education students should be able to demonstrate an awareness of the NMU School of Education's 10 teacher dispositions. Surprisingly, after writing four 5-page observation papers in which participants referenced five or more dispositions per paper, only 46% of secondary education students displayed a clear awareness of the teacher dispositions. Ideally, 100% of pre-methods students should have been able to identify the teacher dispositions. Students' lack of understanding for the 10 teacher dispositions may be tied to their misconceptions of teaching and learning or to the large number and complexity of the teacher dispositions. This research examines pre-methods students' misconceptions of what teacher dispositions entail and the complexity of the teacher dispositions.

**Self Sufficient School Food Program**
Leah Doe-Simkins, Undergraduate Student, Department of History (Joe Lubig, Faculty Advisor)

In recent years there has been a plethora of research linking poor nutrition to poor student performance. Obesity, meal skipping, sugar, and anemia have all been linked to poor school performance. There are many reasons to make poor food choices. Students often skip breakfast, greatly decreasing their ability to perform. Increasing numbers of parents work out of the home, leaving students to choose and prepare their own meals. A lack of money leaves children hungry.

This poster will show links between eating habits and school performance. It will evaluate the efficacy of current school food programs. The focus of the poster will be a plan for a self sufficient school food program. The curriculum will be rooted in the need for student ownership of his or her education. The program will involve a culinary arts class that will develop recipes, grow food, and prepare food. The school will build a greenhouse and partake in the raising and slaughtering of animals. The result will be a curriculum that integrates a variety of subjects while students work effectively in groups and addresses the nutritional needs of students.

**Investing in Girls: The Importance of Educating Females Throughout the World**

Katherine Stenlund, Undergraduate Student, Department of Modern Languages, (Joe Lubig, Faculty Advisor)

Throughout history females have not received the same levels of education as their male counterparts. While females in industrialized nations have achieved great things and are educated at approximately the same levels, females in other parts of the world do not have the same educational opportunities.

There are 103 million children of primary school age in the world not receiving education. Of these children about 60 million are female. Educating these girls is really important; however there are many obstacles hindering their access to education, for instance, poverty and cultural norms.

By educating women, a nation is investing in itself and its future. With an education, a girl is likely to make better choices for herself and her future children; she is likely to get married later, decreasing the likelihood of contracting HIV, they are also more likely to be engaged and involved with her community. Educating girls and women also helps to reduce poverty. The impact of education on females is explored.

**Searching for Mutations Across the Common Loon Genome: A Novel Genotyping Protocol**

Jane Stieber, Undergraduate Student, Department of Biology (Alec Lindsay, Faculty Advisor)

The primary goal of the research initiative outlined in this poster presentation is to characterize common loon (Gavia immer) population dynamics through molecular genetic techniques. Specifically, this project seeks to exploit single nucleotide polymorphisms (SNPs), a type of molecular genetic marker, from the common loon genome as the basis for a protocol to genotype individual birds. It is our hope that subsequent genotyping data will lead to population genetic analyses that will both advance our understanding of common loon conservation and inspire related projects. Through laboratory research this project aims to generate protocols for using SNPs to examine gene flow and inbreeding in North American loon populations. Although the development of an innovative PCR/restriction-digest genotyping protocol is still developing, the project holds special promise in light of recently obtained preliminary results. These data combined with our long-term plan for perfecting this protocol will be the focus of this poster presentation.

**Qualitative Study of Inquiry Learning with General Education Students and Students with Learning Problems when Learning a Foreign Language**

Jessica Schultz-Straczowski, Graduate Student, School of Education (Kathleen Heikkila, Faculty Advisor)

A mandatory enrollment in foreign language classes at the university level is often an obstacle for students with learning difficulties who have problems receiving passing grades in these courses. There is a need to find better methods to help students with learning difficulties to acquire foreign languages in all grade levels. This study investigates the effects on general education students and special education students integrated in the general education classroom when taught a foreign language through the inquiry learning method. The analysis of the data collected imply that the inquiry method has a positive tendency in regards to the effectiveness and enjoyment of learning a foreign language on special education students as well as on general education students.

**Parental Involvement in the Secondary School**
Nora Taylor, Undergraduate Student, Department of English (Joe Lubig, Faculty Advisor)

My presentation, "Parental Involvement in the Secondary School", focuses on the many ways that teachers and school systems can get parents involved. It is a proven fact that involvement of a parent in a student's high school career leads to greater achievement throughout those school years. Strategies that teachers, parents, and school administrators can use will be the most important part of my project. I feel that it is not only important to realize that parental involvement is as essential at the secondary level as it is at the elementary, but also to give the tools to act upon this knowledge. Approaches to handle parents who speak English as a second language, parents who have little formal education as well as single parents, are also very important and are included. Training teachers to work with parents is also a very important factor in parent involvement and that is covered as well. It is crucial to give a student every possible tool to help them succeed, and it is because of this that I think parental involvement is so important and is the focus of my presentation.

**Textbooks in the Classroom**
Jacob Teichroew, Undergraduate Student, Department of History (Joe Lubig, Faculty Advisor)

Knowing that textbooks can be essential for referencing the foundation of material and learning in the classroom, the value of time (for both the teacher and student) and expense must still be considered. When time is not managed properly, both the student and the teacher can be hindered to the extent that the teacher can be less affective and the student is unable to reach their full potential. After looking at examples of classrooms with and without textbooks, how time and expense is used in both can give good reasons for both sides. As a result, it seems that making textbooks only mandatory in subjects where it is necessary for standardized testing seems to be a solution. Also, and importantly, administrators should encourage and give teachers latitude to develop lesson plans above and beyond textbook teaching. In the end, should stimulate students learning and encourage classroom participation by moving past in classroom textbook-based learning. This could make textbooks become valuable again and more appreciated. It could revive students' interest in classroom teaching and at the same time, reestablish the true value of textbooks.

**Secrets to Your First Year as a High School Teacher**
Amanda Tonn & Meagan Prall, Undergraduate Students, Department of History (Joe Lubig, Faculty Advisor)

We are reviewing two books, Your First Year as a High School Teacher by Lynne Rominger, Suzanne Packard Laughrea, and Natalie Elkin; and First Days of School by Harry Wong. Knowing that students do not have the time to review acclaimed books in their field, we felt it would be helpful to present the essential information from these books. In our review, we are going to include a summary of teacher's unions, contracts, teaching as a professional, communication, effectiveness as a teacher, and the stages of teaching.

**Exploring Content Areas Inside and Outside the Classroom**

Anna M. Toutant, Undergraduate Student, School of Education (Joe Lubig, Faculty Advisor)

The project that I am working on will be a poster. It will include information about various programs and events that schools can implement, participate in nationally or locally, or send in pieces of schoolwork to a contest. The display will include programs and events for different content areas: English, math, social studies/history, and the sciences. Items featured on the poster will include basic information about the event or program such as, where it is held, the guidelines, or the entry details and websites or other location where more information can be gathered. This project is designed for teachers so they can get an idea about implementing new goals for their students to achieve. A lot of these events/programs can be included within a unit or lesson plan, providing teachers with a new way to get their students interested in and inspired to learn, especially if it can be done within a content area the students might usually dislike. I will also include some simple ideas that students can participate, through their classes, in the local area: writing an article/editorial for a local or school newspaper, working with a local business to invent advertisement slogans, or make t-shirt designs for a local event like a marathon or mountain bike race.

**Novel Chromophores Based on Propellane**

Benjamin Van Handel, David Burrows, Justin Segula, and Alicia Rhoades, Department of Chemistry (Frankie McCormick, Faculty Advisor)

Nonlinear optical (NLO) materials based on organic molecules are believed to be important for the development of optical technologies. Currently, the search for better NLO chromophores is of great interest. One of the major problems facing the field is the efficiency/transparency trade-off: extended pi electron systems are needed to achieve high polarizabilities and effective second harmonic generation, but increased conjugation often leads to a loss in transparency. We have designed donor/acceptor molecules which rely on the nontraditional conjugation provided by propellane spacers to achieve high polarizabilty with the required transparency. We will discuss the synthesis of these systems and the effect of different donor and acceptor combinations on the ultraviolet/visible spectra.

**Bullying**

Amy VanRemortel, Undergraduate Student, School of Education (Joe Lubig, Faculty Advisor)

Bullying is rising in public schools day by day. I am doing my presentation on bullying because I think it needs to be addressed. I am motivated to put valid information out there for the public to see because I think it is a rising issue. The problem I am trying to solve in bullying. How can bullying be prevented? And if it is present, how does one handle/discipline it? I plan to use statistics and quotes from students for bullying to be noticed and hopefully addressed. I don’t think bullying will ever be solved, but there is always room for progress. There is not one answer to bullying; it takes a team of people, possibly even a committee in a school to try to stop/prevent it. I know there are much bigger issues than bullying out there, but I believe a lot of violence starts from simply bullying. Hopefully, my poster board will be an eye opener and cause the issue to be addressed.

**Method Development of Hycrest Crested Wheatgrass (Agropyron s.) Stomata into a Visual Marker for Trichloroethylene (TCE) and/or Toluene Phytoremediation via Phytovolatilization**

Beth Webb, Graduate Student, Department of History (Lesley Putman, Faculty Advisor)

Plants accomplish phytoremediation (removal of contaminants from soil and water) using several different mechanisms. Phytovolatilization is the physical effect that can occur when plants absorb water contaminated with volatile organic compounds such as TCE and/or toluene. Studies are being done to investigate how plants release (transpire) these contaminants into the air. Stomata (necessary anatomical features for transpiration to occur) are pores (openings) located in the epidermal layers of leaves. Open pores have turgid (swollen) guard cells allowing atmospheric release of volatile organics. It is hypothesized that when visually compared to controls, experimental Hycrest Crested Wheatgrass plants will produce distinct stomata differences characteristic of transpiration of the volatile organics, TCE and/or toluene. Photos of specimens from 3 wheatgrass plants watered with deionized water (control) and from 3 wheatgrass plants "watered" with TCE and/or toluene were taken 24 h after application of 50 mL of deionized water and 50 mL of TCE and/or toluene solution, using an Olympus microscope camera. Stomata from the TCE and/or toluene treated wheatgrass were visually determined to be more turgid (swollen) than the stomata from wheatgrass that received deionized water indicating phytovolatilization of TCE and/or toluene by Hycrest Crested Wheatgrass.

**Instructing with Film**

Brad Winchester, Undergraduate Student, Department of English (Joe Lubig, Faculty Advisor)

I plan on doing the topic of film and movie use in the classroom. There are several different theories on how films should be used in the classroom to maximum effectiveness, as well as what film content is deemed appropriate (although usually content selection is a judgment call by the teacher). I plan on researching the various topics, and formulating my own opinions on what is the best way to teach a film. For the format of my presentation, I would like to do a poster describing the various theories of Film instruction, my personal feelings on the topic, and several images from films and examples of how they can be used in the classroom.

**Pascal's Triangle and the Fibonacci Numbers**

Hailey Winn, Undergraduate Student, Mathematics Department (Sujay Datta, Faculty Advisor)

Pascal’s Triangle is very closely related to the Fibonacci series. Both have many different purposes, and even their purposes are directly correlated. One use that I have personally studied this semester is Pascal’s function in finding probabilities. I would like to focus mainly on that purpose of the triangle, but I would also like to show simple correlation and principles of both Pascal’s Triangle and the Fibonacci series. I will include a couple of advanced ideas of probabilities involving Pascal's Triangle mixed in with very basic ideas of how to find the Fibonacci series within the triangle.

**The First Day of School**

Ryan Zanetti, Undergraduate Student, HPER Department (Joe Lubig, Faculty Advisor)

In the teaching profession it is very important to start the year off with on the right foot with students. There are many strategies that can be used to create the base for the rest of the year. My poster will touch on different strategies that will help the teacher make the first day the best as possible.

The poster will show different ice breakers for the students to get to know each other as well a way for the teacher to get to know students names. The poster will show how to establish a set of ground rules and also a list of comments that are welcoming and other comments that teachers will want to stay away from. The need to set expectations and the importance of subject matter will also be addressed. Some ideas for before the first day of class will also be touched upon.

With this poster future teachers will have a good base of ideas to hit the classroom running on the first day. A well though thought plan is always important on the first day of school.