

2011

Graduate Showcase 2011: Education for the Future

The Graduate School, Grand Valley State University

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Graduate Showcase 2011:
Education for the Future

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Welcome to the Graduate Showcase 2011: Education for the Future

It is with great pleasure that we welcome you to Grand Valley State University's inaugural Graduate Showcase. The theme for this year is "Education for the Future," reflecting Grand Valley's commitment to the future success of our students and our belief in graduate education as key to the future of our state and country.

This showcase offers graduate students a unique opportunity to present their classroom learning and professional experiences. Each of the graduate programs at GVSU nominated students to take part in this event, representing the breadth, variety and rigor of graduate study available at GVSU.

To those in the audience who may be considering enrollment in graduate education, we invite you to tour the poster presentations and ask questions about graduate study, scholarship, and research. Our current graduate students who are presenting will be able to provide you with a first-hand perspective on the graduate school experience at GVSU.

We appreciate the time and energy devoted to this event by our participating students, as well as by their graduate faculty mentors and program directors. We also extend our thank you to the many people who contributed to the success of this event including: Robert Smart, John Stevenson, Karen Loth, Rhonda Lubberts, Nick Viau, Jennifer Palm, and Irene Fountain.

As GVSU celebrates its 50th Anniversary this year, we look forward to the future success of our institution and our graduate students. We hope you enjoy the Graduate Showcase. Thank you for participating in this milestone event!

Sincerely,



Thomas J. Haas
President



Gayle R. Davis
Provost and Vice President
for Academic Affairs



Jeffrey A. Potteiger
Dean, Graduate Studies

DeVos Center – March 28th

4:30 – 7:30 **Poster Presentations and Information Tables
(Exhibition Hall)**

Loosemore Auditorium – 1st Floor

5:30 – Introduction from Dean Potteiger & Welcome from Provost Davis

Graduate Program Presentations:

5:40 - Accounting, Business Administration, and Taxation

6:00 - Communication

6:10 - Criminal Justice

6:20 - Education

 Educational Technology

 Higher Education

 Instruction and Curriculum

 Educational Leadership

 Literacy Studies

 School Counseling

 Special Education

 Educational Specialist in Leadership

6:40 – English

6:50 – Health Administration

7:00 – Public Administration

7:10 – Social Work

7:20 – Close

Cook-DeVos Center for Health Sciences - March 31st

4:30 – 7:30 **Poster Presentations and Information Tables
(Steelcase Lecture Hall)**

Hagar Auditorium – 1st Floor

5:30 – Introduction from Dean Potteiger & Welcome from Provost Davis

Graduate Program Presentations:

5:40 – Biology

5:50 – Biomedical Sciences

6:00 – Biostatistics

6:10 – Cell and Molecular Biology

6:20 – Medical and Bioinformatics

6:30 – Computer Information Systems

6:40 – Engineering

6:50 – Nursing

7:00 – Occupational Therapy

7:10 – Physical Therapy

7:20 – Physician Assistant Studies

7:30 – Close

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Accounting

The MSA program offers students who are interested in becoming specialists an intensive, concentrated learning experience that explores the essential aspects of accounting and permits an in-depth exploration in areas of special interest. The specialized accounting degree is designed for students pursuing careers in public, industry, and not-for-profit accounting. The program is available to students with any undergraduate major, although the curriculum will vary depending on the students' previous business and accounting course work. Students completing the MSA meet the academic requirements for Michigan CPA licensure.

Business Administration

Master of Business Administration (Traditional Part-time MBA Program)

The MBA is designed for individuals of diverse academic and professional backgrounds. The curriculum is general, including courses in the functional areas of business as well as leadership, ethics, and strategy. Students may take a series of defined electives to earn emphases, or they may choose electives from several areas. Most students in the traditional part-time program are working professionals who attend classes in the evenings or an occasional Saturday. The program prepares individuals in such diverse areas as fine arts, business, medicine, and engineering to progress from the technical level of their professions to managerial or leadership roles. A series of four accelerated foundation courses bridges the gap for individuals who do not have undergraduate business degrees.

Master of Business Administration (Full-time Integrated MBA Program)

The Full-time Integrated MBA (FIMBA) is specifically designed for individuals with no, or little, work experience, and an undergraduate degree with a business major. A unique partnership with area corporations enables the Seidman College to guarantee a comprehensive paid fellowship to each student. An integrated curriculum is structured to complement the fellowship, which bridges the experience gap. Also included is a 2-week study

abroad, a 1-week study in Washington, D.C., and significant professional development to position young MBAs for career advancement.

Taxation

The MST program offers students who are interested in becoming tax specialists an intensive, concentrated learning experience that explores the essential aspects of taxation and permits an in-depth investigation in areas of special interest. The program is specialized, practical, and intensely client focused. Students will examine substantive tax law and enhance their analytical and research skills, thus enabling them to analyze a tax problem, identify the relevant issues, and arrive at the appropriate conclusion or courses of action.

Communication

Communication managers and decision-makers are selected for their leadership skills, the ability to apply theory and research, the ability to access and assess information to solve communication problems, and the ability to effectively implement information into the decision-making process. The graduate communication curriculum is attendant to these skills. The Master of Communication program meets the needs of various aspects of professional communication. Individuals in public relations, advertising, journalism, broadcasting, and related areas, as well as those seeking a degree that will enhance their effectiveness and leadership skills within an organization, find this to be a rewarding and beneficial program.

Criminal Justice

The Master of Science in Criminal Justice program is designed to prepare graduate students to become highly capable criminal justice leaders, planners, activists and academicians who will continuously improve the criminal justice system and profession. The program is also designed to prepare those students who are planning to pursue doctoral degrees. Courses are designed to meet the needs of scholars, managers and administrators in law enforcement, adult corrections, juvenile justice, and private security.

Education

Educational Technology

Through this program, educators at all levels will learn how to integrate and maximize technology use in instructional settings. The program prepares teachers and leaders to enhance the academic and personal potential of their students and to evaluate the social and ethical implications of educational policies and practices. Content covers the educational application of technology, such as computers and the Internet, for professional and instructional purposes.

Higher Education

The Master of Education in Higher Education has two emphasis areas, College Student Affairs Leadership and Adult and Higher Education. The College Student Affairs Leadership program is a 42 credit hour program which prepares practitioners for a variety of staff roles in student affairs with a focus on understanding the diverse nature of today's student population, student development theory, and administration of student affairs programs. The Adult and Higher Education, a 36 credit hour program, prepares students for broader roles in higher education administration with a focus on the history, culture, and organizational structure of higher education and the critical issues facing higher education in the 21st century.

Instruction and Curriculum

The Master of Instruction and Curriculum with an emphasis in Educational Differentiation is designed to develop teachers, specialists and administrators to be instructional leaders in differentiated instruction by increasing their knowledge and experience in strategies that meet the needs of a wide variety of learners. Another objective for the M.Ed. is to provide a theoretical framework as well as practical strategies that meet the National Board for Professional Teaching Standards (NBPTS). As in each of our M.Ed. programs, candidates are required to complete a thesis or a graduate project that demonstrates their knowledge and use of research in educational differentiation to guide their teaching.

Leadership, Emphasis in Educational Leadership

The Master of Education in Leadership with an emphasis in Educational Leadership prepares students to work in various areas of building-level administration (e.g., Principal, Assistant Principal, Athletic Director, Dean

of Students, etc.) in K-12 schools. The Educational Leadership program is nationally and state accredited. Students successfully completing the Educational Leadership program are qualified to hold a Michigan Basic K-12 Administrator Certificate. Emphasis courses include Educational Leadership, Curriculum Leadership, Supervision, Personnel, School Law, School & Community Relations, and Administrative Practicum/Internship.

Literacy Studies

The Reading/Language Arts emphasis in Literacy Studies offers graduate students a variety of professional pathways. Students may pursue a master's degree in Literacy Studies with a K-12 Reading Specialist endorsement. Students may also pursue a master's degree in Literacy Studies with either an elementary or secondary reading endorsement. Or, students may pursue a master's degree with no endorsement. The M.Ed. in Literacy Studies with a Reading/Language Arts emphasis prepares students to create literacy-rich environments, meaningful instructional practices and assessments, and to become building-level and district-level leaders in literacy instruction.

School Counseling

The Master of Education in School Counseling prepares students to work as school counselors in K-12 public and private school systems. It leads to a school counselor endorsement or a school counselor license in Michigan. Although training as a teacher is not required to become a school counselor, students accepted into the M.Ed. in school counseling must have completed coursework in their undergraduate degrees in advanced child development, school learning, and classroom management or coursework in these areas will be required as part of their planned programs.

Special Education

The master's degree program in Special Education prepares teachers to serve students with cognitive impairments, emotional impairments, and learning disabilities. This program blends classroom instruction and clinical/field experiences and is centered on the translation of research into practice. Specifically, candidates learn evidence-based practices for: (a) teaching students with disabilities language, math, and social skills; (b) including students with disabilities in the general education curriculum; and (c) transitioning students with disabilities from school to life. Moreover,

candidates apply this knowledge by working directly with students with disabilities in both clinical and school settings. In addition to culminating in a master's degree, this program qualifies candidates for Michigan Department of Education endorsements and is nationally recognized by the Council for Exceptional Children.

Educational Specialist in Leadership

The Educational Specialist in Leadership degree with a cognate selected from administration or curriculum and instruction builds on the master's degree and develops leadership practitioners for school and/or central office administrative positions. The program provides district leaders with meaningful clinical experiences, case methods of teaching, and pragmatic curriculum geared to the specific knowledge and skills required by district leaders and superintendents at different career stages. The program also integrates research designed to build a practical knowledge base for district leaders and policy makers. The primary goal of this degree is to prepare competent and effective leaders for K-12 districts whose management and administrative understanding, skills, and disposition foster quality educational experiences for children and youth.

English

The M.A. in English is a program intended to provide students with advanced studies in the various literatures written originally in English (with occasional supplementary literature in translation). Thus, the program concentrates on the range of literature produced in the English language, regardless of nationality or dialect. British, American, and Anglophone literature are studied with emphases upon literary history, history of genre, close analysis of individual authors and themes, cultural context, and critical theory. Designed in part to meet the needs of high school English teachers, the M.A. program is also suitable for working professionals in publishing, journalism, and library science--or others who simply wish to study intensively a wide range of literatures in English.

Health Administration

The mission of the Master of Health Administration (MHA) program is to prepare students for managerial and leadership roles in the challenging and complex field of health care. The program's learning experiences integrate classroom study, applied research, professional development, and service learning. The program's course of study covers management, finance, ethics, law, policy, economics, marketing, and personnel. An MHA offers career opportunities throughout the healthcare sector, including hospitals, long-term care facilities, assisted living communities, skilled nursing facilities, home health agencies, hospice care, public health departments, research and educational foundations, support and self-help groups, wellness programs, and community health initiatives.

Public Administration

The mission of the Master of Public Administration (MPA) program is to prepare students for managerial and leadership roles with public-serving organizations. The program's learning experiences integrate classroom study, applied research, professional development, and service learning. The program allows students to choose a concentration in public management, nonprofit management, urban & regional planning, health administration, or criminal. An MPA offers career opportunities throughout the public and nonprofit sectors. MPA alumni serve as city and village managers, executive directors, department heads, program officer, budget analysts, city planners, development directors, membership coordinators, environmental control officers, event coordinators, security manager, and research associates.

Social Work

Master of Social Work program is grounded in the Advanced Generalist Perspective and incorporates educational practice standards endorsed by the Council on Social Work Education. These standards reflect evidenced based practice behaviors that have been substantiated by rigorous research methods. These standards prepare students, upon completion of the program, with knowledge, values, and skills required to work competently in professional employment at multiple and diverse levels. Students, in the Advanced Generalist Program, build upon foundational generalist skills that

have been grounded upon assessing, engaging, and intervening with consumers in their environment from strength based perspective. Graduates are equipped to enhance the quality of life for all by addressing social and economic injustices.

Biology

The Master of Science in Biology is a versatile program designed to allow students to achieve individual goals while serving a diversity of student interests. The program helps candidate's extend their knowledge in their discipline, extend their professional skills, gain experience in the application of their knowledge and skills, and helps them develop their abilities as leaders and team members. Students have the opportunity to pursue graduate study in broad areas such as genetics and cell biology, organismal biology, aquatic and terrestrial ecology, and natural resources, among others. As a focus for these M.S. programs, we offer internship, project, and thesis pathways. Optional emphases are offered in Natural Resources and Aquatic Sciences.

Biomedical Sciences

The Master of Health Sciences degree in the Department of Biomedical Sciences is designed to provide excellent preparation for admission to advanced degree programs, employment in healthcare or science or for teaching at the community college level. The core requirements ensure a broad foundation in the sciences while the elective courses are tailored to individual needs. The first year is primarily focused on coursework and thesis exploration. Thesis research is then completed during the second year of the program and topics range from basic laboratory research to applied or community-based research questions, as dictated by the interests of the student.

Biostatistics

The GVSU Professional Science Masters program in biostatistics is an applied degree that emphasizes a hands-on approach. Biostatistics is the application of statistical techniques in the biomedical sciences and our masters program emphasizes applied methodology. Along with cross-disciplinary and professional science courses, students have a core statistics curriculum that includes courses in design of experiments and regression, categorical analysis, clinical trials and an advances perspectives capstone. The program's close ties to the biomedical community are utilized in the student's required

internship experience. All graduates of the GVSU Biostatistics program are currently employed in the discipline of statistics.

Cell and Molecular Biology

The graduate programs offered by the department of Cell and Molecular Biology (CMB) prepare students for employment or further graduate education in the Life Sciences, including biotechnology and biomedical research, by providing a rigorous sequence of theoretical, laboratory and professional training. CMB offers two Master's of Science options: a Professional Science Master's (PSM) in Biotechnology, including a professional internship; and a traditional thesis option. The PSM is a terminal Master's degree intended to prepare students to be leaders in the Life Science Industry while the thesis option includes an in-depth research project and may be a stepping-stone to a PhD.

Medical and BioInformatics

The School of Computing and Information Systems offers a Professional Science Masters (PSM) program in Medical and BioInformatics (MBI). An applied program that uses a hands-on approach, the MBI program integrates computing skills with bio/life science disciplines. Students complete a core curriculum that includes cross-disciplinary and professional science courses, along with computing courses in data mining, analysis and visualization, high-performance computing and clinical information systems, and an advanced integrative capstone experience. The program includes a required internship experience in the biomedical informatics industry.

Computer Information Systems

The master's degree in Computer Information Systems (CIS) is offered by the School of Computing and Information Systems. The program's primary purpose is to make educational opportunities available to west Michigan's professional computing community. The degree is intended for working professionals who are already using computer and information systems in industry. The MS-CIS is an applied computing program that uses a hands-on approach, combining core computing fundamentals and expanded

concentrations in advanced computing topics. Graduates complete two of the following six content areas designed to provide sustained coverage of topics of value in the regional computing community; software engineering, object-oriented technology, information systems management, distributed computing, database management, or biomedical informatics. Either a computing application project or a thesis research provides a culminating capstone experience.

Engineering

The School of Engineering at Grand Valley State University offers the Master of Science in Engineering (MSE) program. The students will graduate in one of the following emphasis areas: Biomedical Engineering, Electrical and Computer Engineering, Mechanical Engineering, Manufacturing Operations, and Product Design and Manufacturing Engineering. The School of Engineering (SOE) MSE program is designed to serve students of diverse backgrounds and career objectives. Students can pursue graduate studies at the master's level in order to enhance their employability, or to establish a research foundation to prepare them for doctoral studies. Engineering professionals who are employed full-time can pursue part-time studies. Engineering knowledge and skills are strengthened by courses and projects that apply advanced engineering methods to solve practical problems. The curriculum comprises of professional practice courses, core courses in the emphasis area, elective courses and capstone experience through project or thesis.

Nursing

Kirkhof College of Nursing offers two graduate degree programs: Master of Science in Nursing (MSN) for the Advanced Generalist/Clinical Nurse Leader and Doctor of Nursing Practice (DNP). The MSN is designed to provide students with the clinical leadership skills essential for the integration of evidence-based practice and coordination of care delivery at the patient-provider interface. The DNP is designed for nurses seeking a terminal degree in advanced specialty nursing practice and offers an alternative to research-focused doctoral programs. The specialty emphasis areas are: Advanced Practice Nursing (child/adolescent or adult/older adult) or Nursing Administration and Health Care Systems.

Occupational Therapy

Occupational therapists and occupational therapy assistants help people of all ages participate in the things they want and need to do through the therapeutic use of everyday activities (occupations) like work, play/leisure, and self-care. This master's degree program includes theory, practice, and research courses, and a two-semester full-time clinical experience. Students learn how to evaluate clients, create interventions, make recommendations for adaptive equipment, and provide education for families and caregivers. Graduates of the program take a national board examination, and our current 3-year aggregate pass rate on that exam is 96.4%. All certified graduates of the GVSU MSOT program are currently employed in the field.

Physical Therapy

Physical therapists provide clients and patients, infants through elderly adults, with services at the preventative, acute and rehabilitative stages, directed toward achieving increased functional independence and decreased impairment. The physical therapy program is 3 years in length and leads to a Doctor of Physical therapy degree. The minimum grade point for application is 3.0. Thirteen full-time faculty members manage the didactic instruction in primarily the musculoskeletal, neurological, integumentary and cardiopulmonary content areas. Students also attend 38 weeks of clinical instruction at arranged sites across the United States, and must complete an in-patient experience and a community based experience. Licensure pass-rate is 100%.

Physician Assistant Studies

The Physician Assistant Studies (PAS) master's program is a professional degree that emphasizes patient care in a primary care setting. In addition to didactic coursework, each student is required to complete 8 hands-on rotation experiences, as well as completion of a master's research project. Along with interprofessional experiences, the students are prepared for entry-level practice with simulation experiences, model patient experiences, and core medical science curriculum to include cadaver anatomy, medical physiology, pathophysiology, clinical medicine, and patient evaluation and procedural

skills. The program's close ties to the medical community are utilized in the student's required rotation experiences locally, statewide, nationally, and internationally. For the past 5 years, all graduates of the PAS program have passed their national certification examination and are enjoying gainful employment in multiple medical specialties with their physician teams.

HEALTH CHECK: ANALYZING TRENDS IN WEST MICHIGAN. Singh H, Isely P, Ramlal R; Master of Business Administration, Seidman College of Business.

INTRODUCTION: This study provides a framework for assessing key data elements and identifying trends in three areas: knowledge foundations, health care trends, and health related economic analysis; which can be used to address the challenges of cost-effectiveness of health-services and healthcare availability in West Michigan (Kent, Ottawa, Muskegon, and Allegan – KOMA). **METHODS:** Data sets were collected from several educational institutes, and governmental and non-profit organizations as well as a survey of area hospitals in KOMA. **Statistical Analysis:** Linear time-based analysis was used to identify knowledge foundation and healthcare trends.

Occupational projections were calculated by extracting a KOMA population based component from overall state projections. Log-log regression analysis was used determine healthcare usage and cost drivers. **RESULTS: Knowledge Foundations:** Distinct increase in patent activity in Grand Rapids since 2005. Patent activity is growing at a faster rate than peer communities in Oregon and Ohio. Enough graduates are being produced to fulfill projected occupational requirements in 2018 with the exception of nurses. **Health Care Trends:** The KOMA and Michigan populations are ageing with a corresponding decline in the 18-34 year old cohort. Increasing trends were identified in select risk factors and disease incidence. Overall health status in KOMA is better than Detroit and Michigan, but worse than the nation.

Economic Analysis: Biggest drivers of fair or poor health are smoking, obesity and binge-drinking. Range of medical facilities/services in Cuyahoga, OH is 3-4 times larger than that offered in Kent, MI but Cuyahoga's population is only twice the size of Kent. Overall hospital confidence in health sector economic viability is high (87%). Emergency room visits, patient care costs and uncompensated charges are increasing. **CONCLUSION:** West Michigan faces significant challenges in the areas of obesity, and binge drinking which lead to diabetes, stroke and heart disease. Coupled with an ageing population and declining low-risk youth (18-34) cohort, demand for medical services is expected to continue to increase. Conversely, the

disturbing trend of rising uncompensated charges reflects the increasing number of persons without medical insurance coverage in challenging economic times. Finally, increasing innovation (patents) in West Michigan may help support growth and investment in the health sector.

GEORGIE'S CONSIGNMENT SHOP: INVENTORY AND CRM PRACTICES.

Eben, M.; Master of Business Administration, Seidman College of Business.

PURPOSE: This case study was written as a tool for students to use in evaluating the place of technology in small businesses. Georgie's Consignment Shop was used as the focus of this case, which asked for analysis of the current and potential inventory and customer relationship management (CRM) systems. **PROCEDURES:** Local consignment shop owner Georgie Roth was interviewed in regards to her business, Georgie's Consignment Shop in Ada, Michigan. This interview, along with industry and local market research, was used to compose an original case study and instructor's manual to be used in class discussions. The case seeks to analyze whether the implementation of technology, namely an inventory management and CRM system, will be a helpful and profitable investment for Georgie's Consignment Shop. The subsequent instructor's manual addresses suggested teaching approaches, student discussion questions and answers, an instructor's chalkboard diagram, a process flowchart, and a comprehensive SWOT analysis, called a TOWS matrix. **CONCLUSIONS:** The case study allows students to arrive at their own conclusion; however, it guides them to make a decision not involving technology. As this is counterintuitive for many classrooms and students today, it opens the door for critical discussion of technology implementation with a cost benefit analysis. **IMPACT:** There are few case studies written in small business management, especially in regards to their IT needs. The Georgie's Consignment Shop case provides a realistic view of technology adoption and implementation needs for this niche.

Communication

(College of Liberal Arts and Sciences)

VARSITY NEWS NETWORK. **Vaughn RH**; Master of Science in Communication, School of Communications, College of Liberal Arts and Sciences.

INTRODUCTION: Research shows that about 94% of athletes will not play competitive sports after high school, which suggests that celebrating and remembering athletic experience is critical. However, print media coverage of high school sports is diminishing, particularly for athletes who do not play basketball or football. The purpose of this project was to create a business plan for *Varsity News Network, LLC*, a network of high school sports news websites, fueled by high school students and faculty to provide media coverage for every sport. **PROCEDURES:** Secondary market research was conducted to determine whether the high school sports market was indeed ready for such an endeavor, the result of which was a full feasibility analysis. This was followed by the development of an execution strategy, identifying and engaging the appropriate staff to assist in this endeavor, raising \$20,000 in startup capital, and preparing a 30-page business plan for *Varsity News Network, LLC*. **OUTCOME:** The outcome of this project was a complete business plan for a startup web and sports company, which resulted in the launch of the business that now serves athletes at 8 high schools and employs 4 people, including the founder. **IMPACT:** Through a real-world application of communication theory, research, and strategies, this project resulted in a successful startup business that generated \$18,000 in revenue in its first 3 months.

GENDER APPEAL AND GENDER IDENTITY IN MAGAZINE ALCOHOL ADVERTISEMENTS. Carrier, KL; Master of Science in Communication, School of Communications, College of Liberal Arts and Sciences.

INTRODUCTION: This thesis examines the appeal alcohol advertisements have to both genders, and how individuals may form their perceptions of gender identity based upon what they view in advertisements. **METHODS:** Content analysis was applied to magazine alcohol advertisements. A convenience sampling of magazine alcohol advertisements was taken from *Cosmopolitan* and *Sports Illustrated* from issues published during May to October 2010. The content analysis focused on five variables: product type, language used, scene, tonality, and which gender the advertisements appealed to overall. Content analyses of alcohol advertisements have typically focused on adolescent exposure to advertisements. In contrast, the focus of this research is on gender appeal and gender identity formation. **RESULTS:** Gender appeal is the most important variable in addressing the overall point of the thesis. Using Fisher's Exact Test, results showed that, of

the variables examined, only the type of language utilized in the advertisement was dependent on the general gender appeal of the advertisement. The variables of tonality, type of product, and scene were shown not to be dependent on the gender appeal of the advertisement. Given the data gathered, and in view of the changing presence of sexuality in alcohol advertisements, it appears that the topic of gender identity is unfounded. **CONCLUSION:** The results of the research do not show statistically significant relationships between most of the variables. The findings do suggest, however, that there is some gender appeal present in magazine alcohol advertisements, especially when the type of language used in the advertisements is taken into account.

Criminal Justice

(College of Community and Public Service)

INSIDE-OUT PRISON EXCHANGE PROGRAM. Blackmer, A; Master of Science in Criminal Justice, College of Community and Public Service.

INTRODUCTION: The Inside-Out Prison Exchange Program is a unique classroom experience that opens the lines of communication between the incarcerated population and criminal justice students. The Inside-Out program bridges the gap between the corrections system and those involved in it, as well as education and the students planning on going into the field. This class is a great way for criminal justice students to get hands-on experience working and interacting with inmates, as well as provides both groups with an academic environment to explore current trends in corrections. **CHALLENGE:** The program presents a challenge, because both the inside and outside students come from very different backgrounds with preconceived notions about one another. **EXPERIENCE:** The class is held inside Michigan Reformatory and is made up of outside students (Grand Valley graduate and undergraduate level criminal justice students, as well as inside students (Michigan Reformatory inmates). The class pairs the two groups together to discuss current topics within corrections like crime, justice, and punishment. **OUTCOME:** The goal of the Inside-Out Program is to create a better understanding of the criminal justice system, namely corrections, for the two sets of students through participation in the class. **IMPACT:** This experience is valuable for students pursuing a career in criminal justice because it allows them to apply what they are learning in the

classroom to a real world situation, while at the same time contrasting what they know with the inside students experiences of being incarcerated.

61st DISTRICT SOBRIETY COURT EVALUATION. Cardinal, M. K.; Master of Science in Criminal Justice, College of Community and Public Service.

INTRODUCTION: This purpose of this study is to evaluate the effectiveness of the 61st District Court of Michigan's Sobriety Court. The court is located in Kent County Michigan and attempts to treat repeat drunk-driving offenders by combining the power of the district court, with substance treatment options available to drunk-driving offenders. **METHODS:** Using secondary data gathered by the 61st District Court, this study analyzes all of the offenders eligible for the program between January 1st, 2003 and October 1st, 2008. Using the Michigan Motor Vehicle Records of the offenders, instances of alcohol related recidivism were recorded for those who were eligible for the program and analyzed based on level of participation, age, gender and self-identified race.

Education (College of Education)

AN HONORS COLLEGE PEER MENTOR TRAINING CURRICULUM (CLARK'S CURRICULUM) PROMOTES ENHANCED COMMUNICATION AND CONNECTION. Clark, S. M.; Master of Education, Higher Education, College of Education.

PURPOSE: Mentor programs are a valuable method through which to communicate institutional information, and this information is often targeted towards the specific population of incoming first year undergraduate students. However, some university mentors struggle communicating effectively with their assigned mentees. With proper training resources available for the mentors, they will have a better understanding and ability to do their job in maintaining relationships with their assigned mentees.

PROCEDURES: This study utilizes theories focused around student environment, student involvement, and student development. To achieve the best implementation of this project it is necessary to look at four main areas: the millennial student, the honors college, the peer mentor role, and technology. **CONCLUSION:** The Clark's Curriculum training program will work to shape the communication and development of mentors through their

peer role. The implementation of this curriculum will enhance not only the communication of the mentors, but also the organization of the peer mentor role and program as a whole. Participants can be expected to strengthen their student leadership skills, increase their ability to communicate effectively with peers, learn to manage conflict in an efficient and productive manner, and become advocates of their community. **IMPACT:** The validity of this project will increase with the frequency of its implementation and data collection. The overall benefits aren't limited to either students or the institution; both will see the advantages because with each improvement, students are benefitting through better peer relationships and communication skills, as are the colleges by attracting promising and better developing students.

SCHOOL COUNSELING INTERNSHIP/PRACTICUM EXPERIENCE.

Baldwin KL: Master of Education, School Counseling, College of Education.

INTRODUCTION: Two 3-credit hour internships (300 clock hours each) are required in the school counseling master's degree program. During internships students are assigned specific tasks or projects related to professional goals of each student. Students are supervised by field supervisors who must be licensed or endorsed school counselors and provide one hour of weekly supervision on-site. **CHALLENGE:** The central challenge of this experience has been to develop and improve my cultural awareness and sensitivity while working with a diverse urban student population.

EXPERIENCE: I am completing my internship at Creston High School in Grand Rapids Public Schools. The lead counselor, Maya Frazier, serves as my on-site supervisor and lead school counselor. **OUTCOME:** Each student submits a final portfolio documenting activities completed over the course of the internship and the GVSU School Counseling program. My portfolio includes artifacts which demonstrate that I understand the philosophy, principles, and practice of school counseling, including the administration and coordination of professional relationships within school systems as well as professional knowledge related to ethical and legal issues and working with diverse student populations in school counseling. The portfolio also contains work samples that provide evidence of my development of professional skills in the field of school of counseling. **IMPACT:** These internship experiences are designed to meet Michigan Department of Education requirements for school counseling licensure or endorsement. Internships also provide

graduate students in the school counseling program with field-based learning opportunities designed to provide work experience in an area of school counseling.

INTEGRATING UNIVERSAL DESIGN FOR LEARNING INTO THE ELEMENTARY CURRICULUM. Parnacott, A.; Master of Education, Cognitive Impairments, College of Education.

INTRODUCTION: Classrooms today are more diverse than ever before. Educators are being asked to include students with disabilities and second language learners into their classrooms. Beyond participation, mandates are holding teachers accountable for these students to make progress in the general education curriculum by attaining Adequate Yearly Progress. This task has educators looking for solutions to help make curriculum assessable for all. Universal Design for Learning (UDL) is a curriculum framework that provides educators with the supports needed in order to reach each and every learner. **PROCEDURES:** During a three hour staff development, teachers participated in a PowerPoint presentation, which gave an overview of UDL and the three principles behind it. The teaching staff was required to bring a lesson or unit that they would be teaching within the next two weeks of the presentation. After the PowerPoint, the staff was given time to explore resources available and create Universally Designed lesson plans. The presenter facilitated the process and offered guidance and suggestions. **OUTCOME:** Teachers were introduced to the principles of UDL and were able to create Universally Designed lesson plans that they were able to use immediately with their students. **IMPACT:** This project provides educators with a toolkit for implementing UDL principles into their lessons making the curriculum more assessable to all students.

TEACHING SELF-ADVOCACY TO EIGHTH GRADE STUDENTS WITH LEARNING DISABILITIES. Bultsma MA; Master of Education, Special Education – Learning Disabilities, College of Education.

PURPOSE: Research has shown that students with learning disabilities are often passive learners and have less positive attitudes towards school because of their history of failure (Firth, Greaves, & Frydenberg, 2010; Kortering & Christenson, 2009). These students might not have knowledge of their strengths and weaknesses or have the communication skills to self-advocate.

Studies have been conducted that show students with learning disabilities are able to learn, retain, and generalize the self-advocacy skills needed for positive school and life outcomes (Durlak, Rose, & Bursuck, 1994; Fiedler & Danneker, 2007; Phillips, 1990; Van Reusen, Bos, Schumaker, & Deshler, 1994). The purpose of this project was to develop an instructional unit for teaching self-advocacy skills to middle school students with learning disabilities. **PROCEDURES:** Strategies that teach self-advocacy skills to students with learning disabilities have been found to include three main sections: (1) identifying the strengths and weaknesses of a student, (2) providing intentional instruction of self-advocacy skills, and (3) providing opportunities for these students to plan for their future, including their transition into high school. **CONCLUSIONS:** This unit on teaching self-advocacy skills to middle school students contains 6 lessons designed to be delivered in 6-8 class periods. In addition to the class time involved, there is a cumulative educational meeting to be held with parents. **IMPACT:** This project includes activities that enable students with learning disabilities to identify their strengths and weaknesses and learn how these skills impact their education. Students have an opportunity to learn about their own disabilities, practice effective communications skills, and become an active participant in their educational planning.

STUDENT ACTIVIST IDENTITY: THE RELATIONSHIP BETWEEN ACTIVIST IDENTITY AND UNDERGRADUATE CAMPUS INVOLVEMENT, Schenk, S.J., Master of Education, Higher Education—College Student Affairs Leadership, College of Education.

INTRODUCTION: Historically, student activism has taken many forms, whether it be service learning, volunteering, feminist activism, or LGBT activism, the labels are endless. However, little research has examined the similarities of experiences across the many forms of student activism. Such experiences may include gained skills and knowledge, as well as developed and maintained relationships through participation in specific activities. Furthermore, to the researcher's knowledge, nothing currently exists to measure these experiences as it relates to student identity and the impact of such identity on the student activist. However, Levine (1999) has identified particular characteristics of current student activists: they work on a small scale, primarily focus on local work, take on manageable and possible tasks, focus on issue-oriented goals and projects, and emphasize human rights and

multiculturalism. They also demonstrate critical hope in creating visible change. The current study strives to examine both the identity of a student activist and the range of student experiences related to student activism. Moreover, identifying specific GVSU sponsored programs that assist in the development of activists; the environment that brings a student to identify as a student activist; and how the identity shapes their experiences as a student and a member of a campus community, as well as a local and national citizen.

English

(College of Liberal Arts and Sciences)

VICTORIAN RESTRICTION, RESTRAINT, AND ESCAPE IN THE CHILDREN'S TALES OF BEATRIX POTTER. DeWilde, M.; Master of Arts in English, College of Liberal Arts and Sciences.

PURPOSE: Since 1902, the works of Beatrix Potter have entertained children and adults of all ages; however, beneath these seemingly cheery tales, Potter's stories suggest something a little darker. Her characters get tangled in nets, wrapped in pastry dough to be cooked, and often come dangerously close to death before barely escaping an untimely end. What would make Potter place her cute and cuddly characters in such dangerous situations? In what way has her Victorian upbringing influenced her works? What was the social atmosphere of England at that time and how was Potter commenting on it through her tales? How has Potter's literature impacted the English landscape? Using Potter's life—including her childhood, adulthood, and her legacy—as the basis for her stories, I have examined the forms of restriction, confinement, and escape in five of the children's tales. **PROCEDURES:** Extensive research of current literature, including criticism and biographies, along with critical analysis of the text and images of five of the children's tales. **CONCLUSIONS:** Beatrix Potter's severe Victorian childhood has influenced the themes of restriction and escape cloaked in her children's tales, and also acted as a catalyst in the preservation of the Lake District. **IMPACT:** Prior to this thesis, there had been no thorough examination linking the influence of Potter's childhood to both the children's stories and her legacy of land preservation in England's rural Lake District.

MILTON AND SCIENCE: DEPICTIONS OF THE UNIVERSE AND THE PURSUIT OF KNOWLEDGE IN *PARADISE LOST*. VandeWaa, D. J.;

Master of Arts in English, College of Liberal Arts and Sciences.

PURPOSE: To show how John Milton (1608-1674) incorporates contemporary scientific theories and discoveries throughout *Paradise Lost* to communicate his view of the correct context for pursuing knowledge based on his own personal theology. **PROCEDURE:** The ways in which Milton is commenting on the loss of religious perspective in contemporary science becomes clear by describing the relevant discoveries and controversies, particularly regarding astronomy, relevant in his time. While he undoubtedly sees developments in astronomy as interesting, the curiosity of Adam, advice of Raphael, and impact of human transgressions reveal that Milton is participating in the scientific dialogue of his time by contributing a cautionary appeal informed by his own religious convictions.

CONCLUSIONS: Even though Raphael tells Adam to “Solicit not thy thoughts with matters hid. / Leave them to God above,” evidence suggests that Milton encourages the pursuit of knowledge as long as a relevant, teleological purpose is ascribed to that knowledge (8:167-168). Taking this as a central premise in Milton’s theology, his purpose in *Paradise Lost* to “justify the ways of God to men” takes on a new meaning: Milton is *describing* God’s creation using modern astronomical theory rather than attempting to *prove* that God’s ways are right (1:26). **IMPACT:** Milton saw science pushing God out of people’s day-to-day experience as ill-advised, even dangerous. Despite Milton’s religious dogma feeling heavy-handed to modern readers, there is something deeply compelling and valuable in Milton’s idea that people should make “deeds,” whether spiritual or secular, “to thy knowledge answerable” (12:581).

Health Administration

(College of Community and Public Service)

THE U.S. NURSING SHORTAGE AND NONPROFITS. Rossman, A.N; Master of Health Administration, School of Public, Nonprofit & Health Administration. College of Community and Public Service.

PURPOSE: The United States is currently experiencing a shortage of full time employed registered nurses at near crisis levels. Nonprofit health care organizations are on the front lines of healthcare in America and are

experiencing the burden created by the nursing shortage first hand.

PROCEDURES: This Paper starts off by examining the issue of the US nursing shortage and the role of Nonprofit Healthcare organizations in solving the problem. It explores numerous factors that are contributing to the problem such as, poor working conditions, low wages, insufficient numbers of nurse educators, insufficient access to nursing education, and insufficient marketing of nursing careers. **CONCLUSION:** My paper offers multiple possible solutions to the issue and concludes that only a multi-pronged approach that addresses all contributing factors is likely to succeed.

IMPACT: My paper explains that the US nursing shortage is a condition of our health care system that occurred due to many interrelated and circular contributing factors. Once the reader understands all issues involved, the solution to the problem easily presents itself. However, it will be difficult for nonprofits in today's society to implement the solution. This is why ending the nursing shortage is a project I will be working on the rest of my career in the nonprofit world.

RATIONING OF HEALTH CARE DURING A FLU PANDEMIC. Faber CC; Master of Health Administration, School of Public, Nonprofit & Health Administration. College of Community and Public Service.

INTRODUCTION: The re-emergence of the H1N1 flu virus strain in 2009 brought to light the population's vulnerability to new virus strains. The 2009 pandemic reached 214 countries. In the United States, the Centers for Disease Control and Prevention estimated that there were over 12,000 fatalities. This number is believed to be a low estimate, as more deaths were not tested for H1N1 or not recognized as being related to the virus. Most local and state governments have flu pandemic preparedness plans but the vast majority does not address what will happen in the event that resources become scarce and rationing becomes a necessity. The purpose of this research is to determine what plans currently exist across the country and to introduce the use of a triage system similar to the kind used by the military for the purpose of rationing care. **METHODS:** A review of published flu preparedness plans was conducted. Emphasis was placed on ethical considerations and proposed methods of determining rationing decisions. **RESULTS:** Only one state has a published flu preparedness plan that directly addresses rationing of resources during a pandemic and includes rationing criteria. **CONCLUSION:** Local and state governments need to plan

for a pandemic that will tax all resources and must prepare for the difficult task of rationing resources. The plan must consider ethical, legal, pre-hospital and acute care, personnel, equipment, alternative care sites and palliative care issues during a flu pandemic. Rationing criteria must be decided to ensure that resources are used in meaningful ways.

Public Administration

(College of Community and Public Service)

MAPPING THE SUCCESS OF STORYTIME AT SUNDAES McMurray; E. Master of Public Administration, School of Public, Nonprofit, & Health Administration. College of Community and Public Service.

INTRODUCTION: This is a term project for PA644, GIS in the Public Service. Storytime at Sundaes is a summer reading program sponsored by GVSU College of Education. On Tuesdays throughout the summer of 2010, any child (age 0 to 15) accompanied by a parent or guardian was given a free book and free ice cream at an ice cream shop located in the Alger Heights neighborhood.. **PROCEDURES:** My objective was to explore whether participants of Storytime at Sundaes program were coming from mostly low areas, as the program sponsored desired.. Using ArcGIS, I compared the location of the participants homes to poverty and race data obtained from the Census. **CONCLUSION:** For being a neighborhood-based program with little advertising, there was a surprisingly wide distribution of participant locations. Within Grand Rapids, the plurality of participants (54) came for the Alger Heights neighborhood, followed closely by those from the Garfield Park neighborhood (49). According to the Census, Garfield Park is one of the poorest neighborhoods in Grand Rapids, as well as one of the most nonwhite. However, the South East End neighborhood is also poor and nonwhite, but contributed relatively few participants to the program. **IMPACT:** The organizers could use this information to refocus their advertising if the program continues next summer.

P.R.O.V.E. GRANT COMMUNITY PARTNER ANALYSIS. Workman, T. Master of Public Administration, School of Public, Nonprofit, and Health Administration, College of Community and Public Service.

INTRODUCTION: This is a term project for PA644, GIS in the Public Service. Positive Relationships Overcoming Violence Experience (PROVE) is

a federally funded grant through the Project Safe Neighborhood (PSN) initiative. Part of PSN's objective is to reduce gun violence among the area's youth. To fulfill this objective, the PROVE grant was funded to provide mentoring services for children who are at risk of gun violence.

PROCEDURES: Information was provided by Project Safe Neighborhood and the Grand Rapids Police Department. Gun-related crime locations were geocoded using ArcGIS 9, as were the locations of PSN's community partners. **CONCLUSION:** The maps show key factors that help guide decision making when community partners are chosen for participation in the mentoring initiative. Each dot represents an armed robbery, aggravated assault or homicide involving a gun. The map on the left shows current community partners. The map on the right indicates potential community partners. **IMPACT:** The map illustrates how the PROVE grant is currently targeting Grand Rapids neighborhoods that have a high prevalence of gun related crimes. In addition, potential future community partners have been identified using this map as a guide.

Social Work

(College of Community and Public Service)

A STUDY OF FAITH-BASED ORGANIZATIONS IN PRISON REENTRY

Freehafer, A.; Master of Social Work, School of Social Work, College of Community and Public Service.

INTRODUCTION: Prisoner re-entry is a growing issue in this country. Nearly 650,000 people are released from jails and prisons each year with many returning because they lack the resources necessary for successful reintegration back into their communities. With budgets getting tighter and tighter, alternatives must be found. Faith-based organizations could be one such alternative. Faith-based organizations have proven themselves as viable options for helping marginalized groups like returning citizens. Yet, there is conflicted thinking on whether they are an appropriate resource in the re-entry process; in addition, there lacks substantial research in the area of faith-based organizations and their involvement in prisoner re-entry. This study is an exploration into one subset of faith-based organizations: churches. **METHODS:** Information was gathered from an organization called Healing Communities that provides curriculum and support to churches in Michigan. These

churches are called Stations of Hope. This study focused on 8 of 14 churches with operational Stations of Hope in the greater Grand Rapids area. It looked at key areas in relation to being a Station of Hope: motivation to establish, activities and services provided, the roles they play, and current identified challenges. This study is hopefully a launching pad for continued research on the impact that faith-based organizations, like churches, can have on individuals, families and communities involved in the process called prisoner re-entry.

FROM TEARS TO TRIUMPH: WOMEN'S SPIRITUAL HEALING AFTER CLERGY SEXUAL ABUSE. Waterstradt, C.J. Master of Social Work, School of Social Work, College of Community and Public Service.

INTRODUCTION: Clergy sexual abuse of adult women is an occurrence which happens with some regularity in religious organizations. This research explores how women who were victims of clergy sexual abuse heal spiritually.

METHODS AND MATERIALS: The participants were taken from convenience and snowball samples. Data was collected by individual, unstructured, phone interviews which were later recorded and transcribed. The funneling technique was used at the start of each interview and feminist theory guided the interview process. The interviews were interpreted through my experience as the researcher and as a survivor of clergy sexual abuse. **RESULTS:** Seven women participated in this research from seven different denominations. Two different religions were represented. Six women found the church's lack of concern for them created more spiritual damage than the actual abuse. Four of the women no longer had anything to do with organized religion. Although these four had sought the help of their denominations, they had been unable to find anyone willing to help them and were left isolated with the task of reconstructing a working spirituality. All seven women had a more relational, experiential spirituality and those who had left organized religion had feminine or gender neutral images of God.

CONCLUSIONS: The denomination's response to the victim directly impacts the healing journey she takes and plays a major factor in determining if she remains within organized religion.

Biology

(College of Liberal Arts and Sciences)

PREDICTING HABITAT QUALITY FOR BOBCATS IN MICHIGAN'S SOUTHERN LOWER PENINSULA USING NON INVASIVE DETECTION METHODS. R. Norris and Keenlance, P. Master of Science in Biology, College of Liberal Arts and Sciences.

INTRODUCTION: While bobcats (*Lynx rufus*) historically ranged throughout the entire US, in the past 150 years persecution and habitat loss have created a noted absence of bobcats in the Midwest. In recent years, they have begun to make a comeback in these highly fragmented areas. Little is known about how bobcats use sub optimal habitat in the Upper Great Lakes Region, particularly in Michigan's Southern Lower Peninsula. **METHODS:** This study used non-invasive track station and camera trap data to analyze bobcat habitat use on a regional scale. Track stations were created and camera traps were monitored in three counties in South Central Michigan. Logistic regression was used to create a model for predicting bobcat occurrence based on regional scale land cover factors at for both male and female home range sizes. These models were then applied within a Geographic Information System (GIS) for the Southern half of Michigan's Lower Peninsula. **RESULTS:** Bobcat sign was detected at 17 track stations and three camera trap photos of bobcats were captured. Land cover variables that proved to be most important were the proportion of grassland and proportion of forest present within a home range sized area. **CONCLUSION:** Much of the highest suitability habitat occurred on State Game Areas. These areas also contain the largest contiguous tracts of forest in the study area. Habitat suitability models, such as these, can help managers conserve species that occur at low densities, particularly species with increasing populations in areas of relatively poor habitat with few refuges.

CHARACTERISTICS THAT PREDICT SUCCESS FOR WARMED TUNDRA VEGETATION. Liebig JA, May JL, Hollister R.D; Master of Science in Biology, College of Liberal Arts and Studies.

INTRODUCTION: The Arctic is more profoundly affected by climate change than lower latitude regions. Warming has been more pronounced in the

Arctic and this trend is expected to continue; vegetation in high latitude regions is also expected to respond to climate change more than vegetation in other parts of the world. In this study we examine the response to experimental warming of plant species at four sites in northern Alaska.

METHODS: Sites were established at the coastal city of Barrow, Alaska (71°17'44"N 156°45'59"W) in 1994 and at the inland village of Atkasuk (70°28'40"N 157°25'5"W) in 1996. Plant community data was collected using a point frame method in 2007 and 2008. Species were classified using a variety of grouping methods based on geography, morphology, and phenology of the plants. Groupings were determined using both observations collected in the field, such as the classification of species as those that with leaf bud burst before and those with leaf bud burst after the mean bud burst date, and observations reported in the literature. Groupings from the literature included geographic distribution schemes based on Hultén (1968) and Young (1971), and morphological criteria based on Sørensen (1941) and Raunkjær (1934). **RESULTS:** Young's zones divided plants into low and high arctic species and were a good predictor of response to warming. Groups from Hultén's maps included circumpolar distribution and distribution within Alaska, and were also good predictors of response. Sørensen described Arctic vascular plant species using a variety of morphological criteria, such as wintering state of leaves, a good predictor. Wintering state of buds, thawing types of species, floral wintering stage, and Raunkjær's life forms were not good predictors of warming response. **CONCLUSIONS:** Preliminary findings show that the most useful classification schemes are those based on distribution of the species. In general, species classified as low Arctic plants tend to increase in absolute cover under conditions of warming, while species classified as high Arctic plants decrease. However, each of the grouping schemes provided insights into potential drivers of vegetation change.

Biomedical Sciences (College of Liberal Arts and Sciences)

ABSOLUTE CD4 COUNT IN PATIENTS WITH HIV AT INITIAL PRESENTATION TO CARE IN A MICHIGAN CLINIC, 2005-2009. Firlik K¹, Lee J², Egwuatu N², Lown D¹, Galang M², Baumgartner D²; ¹Master of Health Sciences, Grand Valley State University, ²Saint Mary's Special Immunology Services, Grand Rapids, MI.

INTRODUCTION: Saint Mary's Special Immunology Services (SMSIS) is a clinic that specializes in the care of patients with HIV/AIDS. New patients undergo a complete medical history and physical examination, including obtaining blood to determine initial CD4 cell count and plasma HIV viral load. Laboratory measurement of CD4 lymphocytes at entry to HIV care has shown to be a good predictor of disease progression in HIV patients. Concurrent diagnosis in patients with CDC-defined AIDS at presentation to care is often due to late diagnosis or late presentation for treatment. This emphasizes the importance of early diagnosis of HIV infection and linkage to care. A variety of factors, including age, gender, and opportunistic infection diagnosis, affect when patients get tested and when they present for care. The demographic and clinical features of patients presenting to care for the first time at SMSIS will be characterized in order to recognize trends in this cohort and assist the clinic providers to set targeted goals for future prevention and treatment efforts. **METHODS:** Eligible patients presented to HIV care for the first time between January 2005 and December 2009. Patients were identified from SMSIS charting records, and 23 separate data points were recorded by the principal investigator from the patient's chart. Standard descriptive statistics will be calculated. Patients with absolute CD4 count greater than 200 cells/mm³ will be compared to patients with absolute CD4 cell count less than 200 cells/mm³ using t-tests for continuous variables and Chi-square tests for categorical variables.

LOOKING FOR EVIDENCE OF PREDATOR-MEDIATED APPARENT COMPETITION BETWEEN *Escherichia coli* AND *Salmonella typhimurium* USING PRD1 BACTERIOPHAGE. Itani F and Graham D; Master of Health Sciences, Department of Biomedical Sciences, College of Liberal Arts and Sciences.

INTRODUCTION: Apparent competition is an indirect interaction between two (or more) species that are preyed upon by a common predator. This ecological principle has been previously demonstrated through interactions between diverse organisms ranging from sea urchins to rodents but also in laboratory constructed microcosms. In apparent competition, one of the host consumers is able to support a greater amount of predation which indirectly causes the decline of the other host consumer. By placing the pathogenically important gram negative bacteria *Escherichia coli* and *Salmonella typhimurium* with a common predator, we hope to demonstrate this principle.

The shared predator used is PRD1 bacteriophage, capable of infecting a broad range of gram negative hosts through the use of conjugative plasmids.

METHODS: Populations of *E. coli* and *S. typhimurium* will be compared when alone, in coexistence, and in the presence and absence of PRD1. Test tubes inoculated in triplicate with the indicated species will be monitored over the period of seven days. Each day, samples from the tubes will be taken, diluted, and plated on various all-purpose and selective media.

RESULTS: Results for the majority of the experiments are pending. Data collected and interpreted thus far lead us to believe that with the use of PRD1, an indirect interaction exists between *E. coli* and *S. typhimurium*.

Biostatistics

(College of Liberal Arts and Sciences)

AN INTERNSHIP EXPERIENCE AT GRAND RAPIDS MEDICAL

EDUCATION PARTNERS. Fast TE; Master of Science in Biostatistics, College of Liberal Arts and Sciences.

INTRODUCTION: My internship experience at Grand Rapids Medical Education Partners will be discussed. The focus of the presentation will be statistical techniques used in the analysis of Dr. Rebecca Davis' 'Wayfinding' project. Methods used include tabular and graphical displays, logistic regression and the chi-square test of independence. Display emphasis is on the understanding of statistical concepts. SAS code and output will be exhibited for reference. **METHODS:** Elderly subjects used a joystick and other strategies to find a predetermined target. Logistic regression modeling investigated which strategies were effective in finding the target for three different age groups. **RESULTS:** Memory was the only significant strategy for the oldest age group while six out of the eight strategies were significant for the youngest age group. **CHALLENGE:** My biggest challenge was the nervousness of not having an immediate Biostatistician supervisor looking over my work. **EXPERIENCE:** I now have experience working with researchers out of the classroom, statistical techniques used with research data, and explaining statistical techniques and results to a non-statistical audience. **OUTCOME:** I have become more comfortable and confident in my work as a Biostatistician. **IMPACT:** During my internship I have seen how the techniques I have learned in course work can be applied in research settings.

ASSOCIATION OF ANILLIN-LIKE PROTEIN MID1 WITH ACTIN

Jakubowski, JL, Hager, C: Master of Science in Cell and Molecular Biology, College of Liberal Arts and Sciences.

The scaffolding protein Mid1 (middle 1), found in the fission yeast *Schizosaccharomyces pombe*, is thought to function as a scaffolding protein. This anillin-like protein assists in the assembly and placement of the actin contractile ring by directly associating with the cell cortex and components of the contractile ring to anchor the structure in the cell center. The placement and functionality of the division septum corresponds to the placement of the contractile ring. Therefore, identifying contractile ring proteins that directly associate with Mid1 will contribute to our understanding of proper cell division and equal transfer of the cellular contents, including the genetic material. Our preliminary results suggest that Mid1 contributes to the formation and placement of the actin contractile ring through the direct association of F-Actin filaments. The main goals of this research project are to identify the actin binding domain in Mid1 and analyze the phenotypic consequence of disrupting the interaction. To test this, we are using actin cosedimentation assays with purified regions of Mid1 protein. After identifying the actin binding region within Mid1, Mid1 mutants with alterations to the actin binding region will be generated and analyzed for cell division defects.

PRECLINICAL EVALUATION OF GENOMIC-BASED THERAPIES IN PANCREATIC CANCER AND GLIOBLASTOMA.

Cherba D, Connors B, Dylewski D, Eugster E, Jahn H, Monsma D, Richardson P, Scott S, Srikanth S, Webb C; Cell & Molecular Biology Department, College of Liberal Arts & Sciences.

INTRODUCTION: The focus of this study is the testing of biomarker-driven analytical methods to identify targeted therapies in pancreatic cancer and glioblastoma, which are highly invasive and metastatic cancers with poor outcomes and few treatment options. The objective was to make treatment predictions based on the molecular signatures of pancreatic cancer and glioblastoma samples, then to evaluate the efficacy of these therapies using preclinical models. **METHODS AND MATERIALS:** XenoBase Bio-Integration Suite (XB-BIS) in an informatics platform for the analysis of molecular data

using Personalized Medicine (PMED) algorithms. PMED applies four independent methods (Drug Target Expression, Connectivity Map, Parametric Gene Set Enrichment, and GeneGo Network Topological Enrichment Analysis) to a genomic dataset to identify targeted therapies. Affymetrix data was collected from panels of pancreatic cancer cell lines and human glioblastoma specimens and analyzed in XB-BIS to predict therapies, which were evaluated *in vivo*. **RESULTS:** Treatment of mice with subcutaneous pancreatic tumors with Chlorpromazine, predicted by CMAP, resulted in a decrease in tumor volume and extended survival compared to control animals. Predictive algorithms identified BCNU, Doxorubicin, and Marimastat as potential treatments for glioblastoma. Combination treatment of mice implanted intracranially with U251 glioblastoma cells showed extended survival compared to control mice and similar survival to standard-of-care treatment, Temozolomide. **CONCLUSIONS:** We have demonstrated efficacy of therapies identified by the PMED approach in relevant models of pancreatic cancer and glioblastoma. While further investigation is needed, these therapies could prove to be a great resource against two devastating human diseases.

Computer Information Systems (Padnos College of Engineering and Computing)

LAVA: A JVM-BASED FRAMEWORK FOR RAPID WEB APPLICATION DEVELOPMENT. Boss, T., Masters of Science in Computer Information Systems, School of Computing & Information Systems, Padnos College of Engineering and Computing.

INTRODUCTION: As the Web has become increasingly interactive, web development languages and frameworks have become indispensable tools for creating Web content. Unfortunately, many of these tools suffer from a steep learning curve, large system footprint, or verbose syntax. Lava aims to overcome these challenges by providing a simple yet robust framework for creating web applications. **METHODS:** Lava consists of two main components: a server, and a set of application base classes. The server dynamically generates and caches application content from the source files. The base classes exist to provide functionality to application objects. The entire project is written in Groovy, a dynamic language that runs on the Java Virtual Machine. Lava's primary focus is simplicity. Lava applications are composed of plain Groovy objects that inherit from one of Lava's base document classes. The base classes provide functionality that allows the application objects to include files, remote URLs, or other Lava objects through the use of tags in their markup. The combination of Groovy's

compact syntax and Lava's built-in capabilities will allow a web developer to write compact, modular, reusable code.

Engineering

(Padnos College of Engineering and Computing)

A NOVEL LAPAROSCOPIC SURGERY TRAINING DEVICE. Shields P., VanOss J. Peck, A. Dickson, C.; Masters of Science in Engineering, School of Engineering, Padnos College of Engineering and Computing.

INTRODUCTION: Laparoscopic surgery is a minimally invasive surgical technique in which operations are performed in the abdomen using one or more small incisions and a specialized camera system. Demand for safe and efficient training techniques has been met with primitive inexpensive “box trainers” and more physiologically accurate but prohibitively expensive virtual reality systems. The purpose of the Electronic Laparoscopy Trainer is to provide an addition to existing box trainers that allows better training efficiency in a cost effective package. **METHODS:** New electronic modules are designed for currently available box trainers with input from surgeons and educators at Grand Rapids Medical Education Partners. The modules can be programmed to light up any number of its twenty-four touch sensitive tiles with up to seven colors. This feature allows implementing enhanced training protocols for increased training efficiency of surgical residents. The new modules allow instant feedback for the trainee and provide quantitative analysis on performance. Data gathered from the accuracy and speed of the trainee’s responses is collected, displayed, and stored for later evaluation. **CONCLUSIONS:** The Electronic Laparoscopy Trainer is versatile and capable of being programmed to simulate a large variety of interactive training protocols. The enhanced trainer is being evaluated by surgeons and educators at Grand Rapids Medical Education Partners.

PROPOSITION OF NOVEL FREQUENCY BANDS FOR HRV ASSESSMENT IN ISOLATED DENERVATED GUINEA PIG HEARTS. Negin Nadvar¹, Bruce Dunne¹, James Heisner², David Stowe², Amadou Camara², Samhita Rhodes^{1, 2}; ¹School of Engineering, Grand Valley State University
²Anesthesiology Research, Medical College of Wisconsin.

INTRODUCTION: This study aims to analyze the myogenic component of heart rate variability (HRV) in the frequency domain in denervated and isolated guinea pig hearts. In previous studies on human subjects, HRV has

been analyzed in low frequency (LF) and high frequency (HF) bands, where they are modulated by sympathetic (S) and parasympathetic (P) systems respectively. This research proposes new frequency bands ($0.15\text{Hz} < \text{LF} < 0.57\text{Hz}$ and $0.57\text{Hz} < \text{HF} < 1.52\text{Hz}$) to account for species-related differences in heart rate. **METHODS:** Four groups of guinea pig isolated hearts ($n=6$ each) were perfused with Krebs's-Ringers (KR) solution. After 30 min stabilization, hearts were perfused continuously either with KR (CON), KR + $1\text{ }\mu\text{M}$ atropine (ATR; P receptor blocker), Kr + $5\text{ }\mu\text{M}$ esmolol (ESM; S receptor blocker), or both ATR and ESM (ESAT) for 30 min followed by 30 min global ischemia and 120 min reperfusion (REP). Bipolar electrograms were recorded from the right ventricle (V) at baseline (BL), 20 min after KR, ATR, ESM and ESAT perfusion, and at various times during the reperfusion period. VV tachograms (beat-to-beat interval vs. time) were analyzed in the frequency domain and the following indices were computed: normalized LF power ($\text{LF}_N = 100 * \text{LF} / (\text{LF} + \text{HF})$), normalized HF power ($\text{HF}_N = 100 * \text{HF} / (\text{LF} + \text{HF})$) and the power-ratio (LF/HF). **RESULTS:** ATR indicated statistically higher LF_N and LF/HF, and lower HF_N compared to CON. ESM and ESAT did not show statistically different values for any of the indices vs. CON. **CONCLUSION:** The observations using the new frequency bands were corroborated by findings from in-vivo studies confirming the suitability of tailoring frequency domain analysis of HRV to species-related differences in intrinsic heart rate.

Medical and BioInformatics (Padnos College of Engineering and Computing)

BUILDING A DYNAMIC EXPLORER TREE TO INVESTIGATE BEHAVIORAL RISK. Bund, J.W., Master of Science in Medical and BioInformatics, School of Computing & Information Systems, Padnos College of Engineering and Computing.

INTRODUCTION: In today's world, especially in health care, good data is the key to good decision making. The massive collection of data on many subjects continues daily and more of this data is becoming freely available to the public to be explored. Yet even if this data is loaded into a relational database, it may not be accessible to researchers or decision makers who may not be experienced in writing SQL. Users of varying experience levels need

tools that can help them visualize data and make its information more accessible. The purpose of this project was to develop a web based application that can enable users to explore data already stored in a database, using an interface familiar to many computer users. **METHODS:** My approach was to represent database querying, through the use of a tree structure similar to that used in file explorers, such as in the Microsoft Windows operating system. The content displayed in the tree interface is displayed dynamically based on which nodes in the tree are opened. The developed solution was built using Microsoft Silverlight, C#, ASP.NET, LINQ to SQL, and SQL Server. The Centers for Disease Control and Prevention's (CDC) Behavioral Risk Factor Surveillance System (BRFSS) was used as an example dataset. The BRFSS is state based and the world's largest, on-going telephone health survey system, tracking health conditions and risk behaviors in the United States yearly since 1984. States use BRFSS data for a multitude of purposes, e.g., to identify emerging health problems and establish and track health objectives, or support health-related legislative efforts. For many states, this is the only data source on health-related behaviors. The BRFSS 2009 data contains 432,607 responses and 400 questions. The size of this dataset makes it both a challenge to study, yet full of interesting querying possibilities.

Nursing

(Kirkhof College of Nursing)

FEASIBILITY AND PERCEPTIONS OF STRUCTURED GROUP REMINISCENCE PHOTO THERAPY ON DEPRESSION SYMPTOMS IN RURAL ELDERLY LONG TERM CARE RESIDENTS: A PILOT STUDY.

Bryant, PM, Leiras-Laubach, C, Schumacher, G; Master of Science in Nursing, Kirkhof College of Nursing.

INTRODUCTION: Mental health data suggests geriatric emotional and psychiatric conditions including depression are substantially higher among rural elders. As the age of the population increases it is imperative for healthcare providers to recognize the incidence of geriatric depression and discover innovative treatment interventions. Group reminiscence is one alternative in the treatment of geriatric depression. A pilot study was conducted to determine the feasibility of measuring the effect of weekly group reminiscence photo therapy on rural elderly nursing home residents' depressive symptoms. **METHODS:** Eleven residents were purposively

recruited and randomly assigned to an experimental group or control group. The groups engaged in six weekly sessions. Each weekly session utilized a theme to initiate dialogue. The experimental group members employed the use of photos in the discussion. The control group used unstructured social interaction. Depression symptoms were measured using the Geriatric Depression Scale throughout the intervention. At the completion of the six weekly group reminiscence sessions a post-intervention session was completed to elicit participants' perceptions of the value of the experience. **RESULTS:** Data analysis is currently underway and will be completed by the time of the presentation. **CONCLUSIONS:** This presentation will highlight the results of this study and the need for future research in the use of group reminiscence photo therapy in the treatment of depression in rural long term care elders. Implications for nursing practice, research, and education will also be discussed.

END OF LIFE SIMULATION OF THERAPEUTIC COMMUNICATION AND CARE USING STANDARD PATIENTS AND SIMMAN®. Robinson, C. F., Brintnall, R., Tomaszewski, K.; Doctor of Nursing, Kirkhof College of Nursing.

INTRODUCTION: Practicing nurses report that they have received very little undergraduate education in palliative and end-of-life (EOL) care. Clinical simulation can provide the student insights into elements of care that provide the most emotional distress for students: emotional support to patients who are dying (and their families), physical care, and postmortem care. Our purpose was to provide students with a risk-free learning environment to observe and then anticipate in an EOL scenario using one standard patient and SimMan®. **METHODS:** Using AACN and ELNEC competencies and course outcomes as a guide, we conducted a live simulation of therapeutic EOL communication with standard patients, and simulation of an actively dying patient, using one standard patient and SimMan®. A doctor of nursing (DNP) student taped an interview of a standard patient couple processing the recent bad news of a terminal diagnosis. Students interviewed the standard patients after viewing the video, discussing which communication techniques were helpful. Three weeks later, the patient (now SimMan®) was readmitted to our simulation lab with his standard patient wife, and students were invited to participate in the care of the patient and

his family while he died. **RESULTS:** Students were reticent to volunteer to participate in the death simulation. During the debriefing with the class, barriers to participating in the simulation, given the safe environment, were discussed. Feedback included discomfort with caring for the dying without more experience. **CONCLUSIONS:** This simulation underscored the need for further education for undergraduate nurses in palliative and EOL care.

Occupational Therapy

(College of Health Professions)

HAND GRIP PRESSURES BETWEEN VARIOUS TRANSDUCERS AND THE RELATED PERCEPTION OF PAIN EXPERIENCED BY SONOGRAPHERS.

Bullock H, Conroy C, Vetter L: Master of Science in Occupational Therapy, College of Health Professions, Cook-DeVos Center for Health Sciences.

INTRODUCTION: Musculoskeletal disorders are one of the most common types of work related illnesses. Medical sonography has been specifically affected by the burden of work-related musculoskeletal disorders (WMSDs). Approximately 80% to 90% of sonographers have been affected by WMSDs. This may be due to the repetition and force exerted during daily workload and it is suggested that the transducer design may be a major factor in hand-wrist strains. To prevent strain, scanning ambidextrously has been recommended to possibly reduce repetitive injuries. The demands for medical sonography have increased but ergonomic improvements of scanning equipment have yet to meet those demands. There is a lack of research to show what design of scanning equipment would be best suited to reduced WMSDs and still obtain a quality scan. This study will analyze the pressure exerted on two ultrasound transducers, each with a different design, to determine if transducer design results in significant difference on the amount of pressure exerted to obtain a quality scan. **SUBJECTS:** Three experienced sonographers will perform separate scans with their right and left hands on the same volunteer model. Each scan will be performed on the volunteer's left and right kidney with two different transducer designs. **METHODS:** A Novel Pliance hand sensor will be secured around the transducer to determine the amount of pressure exerted directly on the transducer. Before and after the scans, sonographers will be asked to rate their perceived level of pain, comfort, and transducer preference via an interview and written questions. **RESULTS:** Data has yet to be collected and analyzed to determine the results. **CONCLUSION:** This study will be done in hopes to determine the relationship between pressure applied and pain experienced.

USE OF HIKING TRAILS BY OLDER ADULTS WITH LOW VISION.

Johnson T, Stenvig M.; Master of Science in Occupational Therapy, College of Health Professions, Cook-DeVos Center for Health Sciences.

INTRODUCTION: A study conducted in 2008 found that 3.5 million people over the age of 65 reported disability due to visual difficulty (Brault, 2008). Older adults with low vision experience a significant impact on their leisure occupations, especially the health benefitting occupation of exercise. Multiple hiking trails in Michigan have made accommodations to foster accessibility for people with disabilities but only a few hiking trails have specifically addressed issues of low vision. Furthermore, there has been little research performed to prove the effectiveness of these accommodations. This study will seek to understand accessibility and use of hiking trails by older adults with low vision, which is a disability characterized by vision that cannot be corrected better than 20/70. **METHODS:** This study will separately survey 50 adults over the age of 65 with low vision and 10 supervisors of parks in Michigan. The survey for older adults with low vision will seek to find current and past usage of hiking trails, perceived barriers and facilitators for using hiking trails, and desired accommodations for trails they would like to use. The survey for park supervisors will assess current accommodations to park trails and knowledge of current older adult visitors with low vision. Surveys will be analyzed for common themes and resultant recommendations will be offered to applicable Michigan trails. **RESULTS:** Results will reveal common themes among survey participants. **CONCLUSIONS:** This study will provide a conclusion about the effectiveness of existing trail accommodations, as well as, what accommodations are still needed.

Physical Therapy (College of Health Professions)

FALL AND BONE-RELATED RISK FACTORS IN INDIVIDUALS WITH FRAGILITY FRACTURES OF THE DISTAL RADIUS: ARE WE ADEQUATELY ADDRESSING SECONDARY PREVENTION OF FALLS AND FRACTURES? Harro C, Campbell K, McLeod J, Langstaff E; Department of Physical Therapy, College of Health Professions.

INTRODUCTION: Fragility fractures indicate a significant risk for future fractures and necessitate referrals for comprehensive evaluation and risk reduction. Although clinical guidelines describe best practice for falls and

fracture prevention, clinical use of these guidelines may be inadequate. The purpose of this study was to describe fall and bone-related risk factors associated with a positive fall history and referral patterns for physical therapy services in persons with a fragility fracture. **METHODS:** A comprehensive survey to identify risk factors for osteoporosis, future fracture, and falls, was distributed to 264 adults who sustained a distal radius fragility fracture; 100 adults were included in this study. Chi-square, Fisher's Exact tests, and odds ratios were performed to analyze associations between risk factors, post-fracture fall history, and referral for exercise. **RESULTS:** A positive fall history post-fracture was reported by 25% of the sample and 41% reported 3 or more fall-related risk factors. Positive history of near falls (OR=16.55), fear of falling (OR=5.42), poor self-rated general health (OR=4.28), and no prescription for calcium/vitamin D supplementation (OR=7.00) were significantly associated with positive fall history post-fracture. Only 16% of the sample was referred for exercise or fall prevention post-fracture. Referral for osteoporosis evaluation (OR=3.28) and calcium supplement prescription (OR=3.21) were the only factors significantly associated with referral for exercise. There was no referral for exercise in 80% of subjects who experienced frequent falls post-fracture. **CONCLUSIONS:** These results illustrate a gap between best practice guidelines for secondary prevention and current clinical management in individuals with fragility fracture.

A METHOD FOR PROVIDING HIGH-VOLUME INTERPROFESSIONAL SIMULATION ENCOUNTERS IN PHYSICAL AND OCCUPATIONAL THERAPY EDUCATION PROGRAMS. Shoemaker MJ, Beasley J, Cooper M, Perkins R, Smith J, Swank C; Departments of Physical and Occupational Therapy, College of Health Professions and Simulation Center for Health Professions.

INTRODUCTION: With an increasing emphasis on interprofessional education within the allied health professions, simulation has potential for being a useful teaching modality for providing collaborative learning experiences for occupational and physical therapist students. However, there are many challenges associated with conducting simulations with large numbers of students. The present paper describes the design, planning, cost, and support staff time required for conducting an interprofessional simulation of the intensive care setting, including a methodology for

maximizing resources and student opportunities for participation for 64 physical and occupational therapy students over a 4 hour time period.

METHODS: Descriptive analysis of the design, planning, execution, and required resources for conducting a simulation using standardized patients. Qualitative analysis of self and peer review documents, as well as the overall simulation debriefing for relevant themes related to student experiences and learning outcomes. **RESULTS:** The ability to both observe and directly participate in a simulation is highly valued by students. Themes related to range of motion measurement, patient-centered care, role delineation, and logistics emerged from the qualitative analysis. **CONCLUSIONS:** Simulation-based learning is highly-valued and well-liked by students, but requires considerable staff and monetary resources beyond the time the primary faculty member might spend developing a new laboratory or learning activity. The actual cost of a simulation could vary considerably between institutions depending on the level of fidelity and technology available or desired, the salary of the staff utilized to plan and conduct a simulation, and the availability and quality of technological infrastructure (e.g., video servers, cameras).

Physician Assistant Studies

(College of Health Professions)

CLINICAL ANTECEDENTS TO IN-HOSPITAL CARDIOPULMONARY ARREST AFTER INSTITUTION OF A RAPID RESPONSE TEAM Loney, B., Nassri, R., Patel, D., Barron, J., Bacon-Baguley, T.; Department of Physician Assistant Studies, College of Health Professions.

PURPOSE: The concept of the Rapid Response Team (RRT) originated from the observation that patients receiving care in hospitals often had physiological deterioration several hours prior to a cardiac or respiratory arrest. The purpose of this study was to analyze the 24 hour time period prior to an arrest to evaluate the utilization of the RRT and to determine if there were clinical antecedents indicating physiologic demise. **SUBJECTS:** Subjects were identified as having a cardiac or respiratory arrest within a one year time period. **METHODS:** A case control design was used in this study. A data collection tool was utilized to document demographic information, laboratory values, and cardiovascular, respiratory, central nervous system and renal parameters 24 hours prior to the arrest.

ANALYSIS: Descriptive statistics were used to describe the use of the rapid response team. **RESULTS:** Twenty four hours prior to the arrest, the RRT was called in 10 cases for the following reasons: unresponsiveness and altered mental status. A consistent physiologic parameter was not identified as a predictor of demise. However, the following observations in the 24 hours prior to the arrest were made: mental status changes (17subjects), documented arrhythmias (20 subjects), change in speaking (10subjects), and chest pain (10 subjects). **CONCLUSIONS:** 10% of subjects who had a cardiopulmonary arrest had a prior RRT intervention and there was not a consistent physiologic indicator of arrest in the prior 24 hours which would have indicated physiologic demise.

QUALITY OF LIFE OUTCOMES AFTER SACROCOLPOPEXY Lillmars, L., Conner, R., Wiegand, B., Hamati, S., and Bacon-Baguley, T.; Department of Physician Assistant Studies, College of Health Professions.

PURPOSE: The purpose of this study was to compare pre-surgical and post-surgical quality of life outcomes pertaining to bladder, bowel and vaginal symptoms after daVinci sacrocolpopexy for vaginal prolapse. **SUBJECTS:** This study included 100 patients who had daVinci Sacrocolpopexy for uterine prolapsed. **METHODS:** Subjects were mailed the following quality of life questionnaires: PFIQ-20 and two versions of the PFIQ-7. One version of the PFIQ-7 measured quality of life before surgery and the second after surgery. Two additional questions were included in the mailings which were: "Overall, how do you feel in terms of your prolapse since your surgery?" and "Would you choose to have the surgery again?" **ANALYSES:** Descriptive statistics were used to describe the sample and the Wilcoxon Signed-Rank test was used to determine significance. **RESULTS:** A total of 57 patients (57%) returned the surveys A significant decrease in symptoms was found between pre-surgical summary scores of the PFIQ-7 and post-surgical summary scores ($p<0.01$). The pre-surgical bladder, bowel, and vaginal symptoms showed a significant decrease compared to the post-surgical bladder, bowel and vaginal symptoms ($p<.001$, $p=0.007$, and $p<.001$ respectively). The PFIQ-20 results identified that a majority of subjects had no complaints regarding their vaginal prolapsed after the surgery. No patients reported to be worse or markedly worse after the surgery, and 95% reported that they would have the surgery all over again. **CONCLUSIONS:** Based on this study, daVinci

sacrocolpopexy resulted in an increase in quality life in the area of bladder, bowel, and vaginal symptoms.

