

THE *Viking* SCHOLAR

2016
1st Edition

*A Research Publication of
Valley City State University*



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STATE UNIVERSITY
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**SOAR ♦ Conference Presentations
Scholar Symposium ♦ Publications**



Welcome to the first edition of *The Viking Scholar*. This publication is made possible as a result of dedicated faculty who mentor and challenge students to present papers at professional conferences, as well as recent initiatives, and established programs that have fostered and supported student research. The result has been an increase in the depth and breadth of research taking place across the campus.

When Valley City State University decided to produce this publication, a call went out to staff, faculty, and students to submit a publication title. With about thirty entries, the Student Opportunities for Academic Research Committee (SOAR) chose the current title, which was submitted by Dr. Kathryn Holleque, Professor in the Education Department. The students on the cover are the first recipients of the new SOAR undergraduate research program at Valley City State University. From left to right: (Back row) Maxwell Kollar, Eric Schauer, Logan Olesen, Justin Tangen, Niklas Ernst (Front row) Monika Browne, Cassy Gilbertson, Tarah Cleveland, and Kaylee Johnson.

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I. Student Opportunities for Academic Research (SOAR)

Over the last decade, undergraduate research has significantly increased across campus at Valley City State University. This research has been fueled by dedicated faculty who believe that in-depth research is among the most effective high-impact learning practices. To support undergraduate research, President Dr. Steven Shirley, in 2013, began to lay the groundwork to establish a new program to support undergraduate research grants. This was made possible, in part, by leveraging grant dollars from the Fund for the Improvement of Postsecondary Education (FIPSE) to support interdisciplinary student-driven, faculty-mentored projects.

In March of 2014, Vice President for Academic Affairs, Dr. Margaret Dahlberg made available \$10,000 to award students with research grants. In the fall of 2014, an advisory committee was formed to design an undergraduate research program, with Drs. Steven King and David DeMuth, Jr., Director of Undergraduate Research, co-chairing. The program was named "Student Opportunities for Academic Research" (SOAR). The program was established to help students gain a fundamental understanding of basic research principles and applications, preparing them to present their research at a regional or national conference or an equivalent academic forum.

During the 2014-15 academic year, the SOAR committee awarded its first eight grants. The grants allow for students to work directly with faculty mentors on projects in all academic disciplines. The first eight recipients represent diverse academic disciplines across campus: Social Science, Art, Environmental Science, Science, Software Engineering, and Theatre.

In May of 2015 President Dr. Tisa Mason hosted an inaugural banquet celebrating and recognizing the SOAR grant recipients. Students, mentors, parents, along with the SOAR Advisory Committee joined the celebration with Drs. Mason, Dahlberg, and King providing commentary. Now in its second year, a new round of SOAR research proposals are being solicited, continuing what will be a long-standing tradition at VCSU.



In April 2015, Valley City State University hosted its first SOAR banquet. Parents, mentors, and the SOAR committee gathered to honor and recognize the eight undergraduate research grant recipients.



Highlighted in this edition of *The Viking Scholar* are two SOAR grant recipients, Monika Browne and Logan Olesen.

Monika Browne is a non-traditional student pursuing an English major and a Theatre Arts minor. Originally from Warsaw, Poland, Browne is building a career as a writer and performer. Currently Monika works as a paralegal at a law office where she has the opportunity to put her writing and research skills into practice. Due to her international status, Browne has always taken a deep interest in the areas of multilingualism, cultural diversity, immigration, and assimilation. Her work within the SOAR project has allowed her to pursue research into the topic of transnationalism, culminating in a self-penned stage play about dealing with the bureaucratic machine faced by immigrants. Browne has successfully presented her performance to the local audience with requests for future performances and public speaking opportunities in the region. Connections made with instructors at VCSU helped Browne spearhead self-expression into future work in immigrant groups where she hopes to build multicultural social connections by sharing art.

Logan Olesen is a junior from Brooklyn Park, Minnesota. He will graduate from Valley City State University in May of 2017 with a major in Biology Education and a concentration in Chemistry. As a future educator he would like to become the teacher of the year in the state that he resides in. The SOAR program gave him the opportunity to be independent in the lab and use the knowledge that he has obtained over the years. This young man has proved that he can be productive in the lab and overcome obstacles that may arise. As an undergraduate student, not many get the opportunity to do independent research and for this he is grateful.



2014-15 Student Opportunities for Undergraduate Research Recipients:

The following are the 2014-15 Academic Year SOAR recipients and project titles. Faculty mentors are listed in parentheses. Abstracts accompanying SOAR proposal submissions are included with some editing.



Monika Browne

Browne, Monika. (Mrs. Dina Zavala-Petherbridge) “Entranced: The making of a transnational woman.”

Immigrants are often portrayed and defined in mass media as people who move to the United States for a specific gain: escape from danger to gain peace, escape from poverty to gain stability, the receiving of a Green Card, pursuit of the American Dream. Gains or benefits which polarize the American public oscillate between the scrutiny against an immigrant and the generosity towards a newcomer. By writing a performance piece about my own experience in the United States, I would like to explore a different kind of alien: the transnational woman. An ambiguous type of immigrant emerging from the complex influx of foreigners into the American society, the transnational woman is an immigrant who cannot be fully described within the confines of traditional immigration vocabulary because she does not enter the American society in order to gain something. A transnational woman leaves home in order to follow her employment, her family, or her partner. In that sense, her entry into another culture is the result of a free choice, an exciting opportunity, sense of adventure, or a sense of duty. A one-woman show where the protagonist examines her journey from one culture into another, and reevaluates, in the process, her perception of being a woman, will be the result of research into my family history and the deeper understanding of womanhood during the past 10 years of my life in the United States.



Tarah Cleveland

Cleveland, Tarah. (Dr. Razib Iqbal) “Investigating a new approach to web visitor engagement measurement.”

In the United States, Internet advertising revenues totaled nearly \$42.8 billion in 2013 which is a 17% increase from the year 2012 (IAB Internet Advertising Revenue Report 2014). As revenues from Internet advertising continue to grow, advertisers seek popular web pages for placing ads in an effort to maximize profits. An important measure of how well a website is doing or how attractive they are to advertisers is how engaged the web visitors are with that website. For example, Philly.com (home of two Philadelphia newspapers, Inquirer and Daily News) uses an “engagement index” which takes into consideration seven categories to measure web visitor engagement. These categories include duration index (visitors who spent at least five minutes on the site), click index (visitors who viewed at least six pages), regency index (rate at which visitors return to the site over a period of time), loyalty index (registered visitors or a minimum of three visits per week), brand index (website URL referral or visiting from a bookmark), interaction index (visitors that interact with the site’s comment pages or forums), and participation index (activity on the site by posting, sharing, and uploading contents) (Beckett, 2010). Now, our preliminary study has revealed that there are some fundamental problems with current measurements for web visitor engagement. For example, session duration which tracks visit time on a web page does not take into consideration the physical away time of the web visitor from the computer or when a visitor switches to a different tab or application. Therefore, while advertisers commonly rely on a visitor’s time spent looking at the website, traditional web analytics tools have some limitations to measure this accurately (Peterson and Carrabis 2008).

In order to address the need for an efficient web engagement tool, in this project we propose to investigate a method for accurately measuring session duration and web visitor engagement. Initial focus of this investigation will be on gathering and analyzing requirements to improve the measurement of “engagement index”. As a proof of concept, we shall attempt to build a tool or add a feature to the existing web analytics tools such as piwik.org. The long-term objective of this research initiative is to give guidance to the online advertisers on their selection of pages based on the actual degree of engagement of the web visitors with other similar webpages.



Niklas Ernst

Ernst, Niklas. (Dr. Luis da Vinha) “The Unfinished Presidencies: Why Incumbent Presidents Lose Their Re-Election Campaigns.”

Throughout the history of the United States, 20 presidents won two consecutive terms in the White House, while only 10 lost their second presidential election. While the likelihood for an incumbent president to be re-elected is not as high as in the House or Senate races, data demonstrates that incumbent presidents are usually likely to win their bid for a second term (Phillips, 2012). Political Science has demonstrated that incumbent presidents have several advantages which they can use in order to gain re-election – i.e., party nomination, recognition, access to campaign funding and government resources, campaign machines. The “incumbent advantage” has been thoroughly studied and its theoretical assumptions are well developed.

However, despite these advantages, some incumbent presidents are unable to guarantee electoral victories. In the post-war years Presidents Gerald Ford, Jimmy Carter, and George H.W. Bush did not win their re-election bid despite having access to all the advantages every other incumbent president had. The individual electoral processes have been studied by several presidential scholars and political commentators. Nevertheless, the explanation of these anomalies has yet to process a theoretical framework which allows us to develop a sound understanding of the conditions under which the incumbent advantage is inadequate.

In this research project I will analyze what factors contributed to falsifying the incumbent advantage in the cases of Presidents Ford, Carter, and Bush. More precisely, I will analyze the factors and dynamics at work in each of these candidacies in order to try to identify a discernible pattern which may subvert the advantages characteristic of incumbents. The development of a theoretical framework explaining the different dynamics involving presidential re-elections will allow us to generalize about the relationships between variables and, to the extent possible, construct a general proposition about the success or failure of the incumbency advantage.



Kaylee Johnson

Johnson, Kaylee and Cassy Gilbertson. (Professor Karri Dieken) “3D Printing K-12 Project Curriculum.”

The purpose of this project is to educate, create, innovate and collaborate in the use of art and technology with the Makerbot 3D printer. The development of interdisciplinary curriculum within Math and Art are exceedingly vital measure of a learner’s critical thinking process. The focus of this project is to generate specific and beneficial understanding in learners via new lessons and hands on activities. These activities will include problem solving, cognitive process, communication, aesthetic engagement, collaboration, elements of design, and technology literacy. Combined curriculum lesson plans will be distributed to the appropriate grade levels and parallel with the North Dakota State Education Standards.

Our ambition is to educate K-12 students on the importance of intergrading Arts into the STEM program to create STEAM. In addition to, the collaboration of art and technology, we also aim for the students to achieve the ability to link a connection between various areas of study throughout their educational experiences. We will create lessons/curriculum for grades 3, 7 and 12 connecting Technology, Math and Art through the use of ND State Education Standards, Makerbot, basic Math skills, and drawing sketches. We will develop the curriculum, educate ourselves on the programs and equipment, then teach the programs to various school groups with Community School of the Arts.



Cassy Gilbertson



Maxwell Kollar

Kollar, Maxwell. (Dr. Hilde van Gjissel) “Creating a Bacterial Mercury Sensor using Synthetic Biology.”

The purpose of this research is to create a bacterium that will detect mercury. This will be accomplished through the process of synthetic biology. Synthetic biology is “to make biology in to an engineering discipline” (Malley, Powell, Davies, & Calvert, 2007). Biology is the study of life but not the process of trying to mimic or manipulate it. However, synthetic biology is a combination of traditional biology and engineering. It is a bold new science that holds endless possibilities (Osbourn, Paul, Rosser, & Lindsey, 2012). For this research project, the DNA sequence will be modified by inserting a plasmid in a bacteria

that will release a blue pigment when mercury is present. By attempting to do this both traditional biology and engineering principles will be used. The results of the project will be used in several labs for several courses at VCSU. Along with creating a learning opportunity for others it will allow me to gain skills I will use greatly in my future.



Logan Olesen

Olesen, Logan. (Dr. Susan Kilgore) “The use of sand fraction lithology analysis to differentiate sediment layers at an archeological site in Grand Portage, Minnesota”

Abstract: Grand Portage National Monument is a 710 acre unit of the National Park Service located in Grand Portage, Minnesota. The park is located on the reservation of the Grand Portage Band of Ojibwe, who have occupied this area for centuries. Grand Portage was an active fur trade post from the mid-1700's to the early 1800's (Birk, 1984; Birk, 2005). The Grand Portage area is rich in archeological sites, with many known sites located throughout the park. The site that is of interest for this project is located along the shore of Lake Superior.

This location is rapidly eroding into the lake, due to wave erosion, so a massive excavation took place in 2014 to retrieve artifacts. The excavation revealed two distinct sandy sediment layers, both of which contained artifacts. The apparent stark difference between the two layers has sparked arguments and has sparked debate between researchers working in the area because some believe that the upper layer is fill dirt, rather than a natural deposit. However, the abundance of artifacts within this upper layer means that, if the sediment is fill dirt, it was obtained from another archaeological site.

The goal of this project is to investigate the lithological characteristics of both the sandy layers at the shoreline site to determine whether or not they are related. Using a sand fraction analysis technique (Hallberg, 1978), we will identify the lithology of the sand grains from samples obtained from the upper and lower sand layers. We will statistically compare the results for each of the layers to determine if they are similar. If the layers have comparable characteristics, we can infer that they have similar depositional histories, and that the upper layer is natural. If the results show that the sands are different, we will know that the units are not related, and researchers can investigate further in the future to determine the depositional history.

Schauer, Eric. (Dr. Gary Ketterling) “Engineering an Autonomous Ecosystem for Use in Science Classrooms.”

This Project is focusing on engineering a complete autonomous ecosystem that can be integrated into a curriculum for a high school classroom. A complete ecosystem will include terrestrial plants, aquatic plants, carnivores and herbivores. Once the system is in place it can be used for many different types of experiments and inquiries for classes including Biology, Ichthyology, Botany, Genetics and Ecology.



Justin Tange

Tange, Justin. (Dr. Andre Delorme) “Using Side Scanning Sonar to Detect Mussel Beds in North Dakota Rivers.”

Freshwater mussels (also known as clams) are classified by some as keystone species due to their disproportional large impact on the ecosystems structure and function (Geist, 2010). Freshwater mussel populations over the past 75 years have dropped to record lows due to changes in the nature patterns of the river (Williams, 1993). Since mussels are sedentary feeders and remain in the same location for many years, small changes in their environment can have devastating effects. This project will utilize side scanning sonar to map river beds and use the images produced to possibly detect mussel beds in three area rivers. To gather the data for the research we will be taking a small boat down the center of the river equipped with side scanning sonar and GPS; images and positions are recorded onto the sonar. Compared to traditional means of locating freshwater mussels, side scanning sonar is not only more efficient but can be used in areas that are too dangerous to be done by traditional means. The three local waterways that will be sampled are Baldhill Creek, the Sheyenne River, and the Red River. The rationale for choosing these locations is they have been sampled in past years and have data established. Since we know where the highest density of mussels are, we hope to use side scanning sonar to set up baseline imagery for possible mussel beds. Using GIS techniques we will map the bottoms of these three rivers. With that baseline image we will compare it to incoming and/or saved imagery for similarities potentially finding new mussel beds and populations. In this proposal we are asking for funding primarily for data analysis I will do next fall using data we collect this summer.

II. Scholar Symposium

During the 2006-07 academic year, several faculty in the Communication Arts and Social Science (CASS) division desired to create an opportunity for students to showcase research taking place in the classroom. The outcome of this was the first Student Symposium in April of 2007. Several faculty from CASS signed up to have their students present their research. Other faculty from CASS agreed to serve as judges to evaluate the work. In 2010, the Business Division joined with CASS; the Symposium has since expanded to include classes from all academic programs. For the first six years, all students in participating classes showcased their work. It was hosted twice a year, the last Tuesday of the Fall and Spring semester. Starting in 2012-13 academic year there were a few significant changes. The leadership decided to have an annual symposium in the spring. They also decided to make it more competitive, requiring

students to qualify to showcase their work. Faculty would decide how they would select the best work from each participating class. In some classes, faculty use peer-evaluation as a method for qualification. Those selected would qualify to showcase their work at the Scholar Symposium. In the spring of 2015, there were thirty-seven entries from six departments. Students would judge for the "Viewer's Choice" and thirty-five judges comprised of faculty and staff would judge for Best in Show, Runner Up, and Third Place.



Dallas Petersen presenting his symposium project to faculty, staff, and students.



Student display of projects at the spring, 2014 Scholar Symposium.

The 2015 Student Scholar Symposium awards:

BEST IN SHOW AND VIEWER'S CHOICE AWARDS



Tarah Cleveland

Cleveland, Tarah. "Web Visitor Engagement: Where We are Today."

Each year, billions of dollars are spent on internet advertising. Advertisers seek popular web page for placing advertisements in an effort to maximize profits. An important measure of how well a website is performing or how attractive it is to advertisers is how engaged the web visitors are with that website. In this presentation, I will show our research on the current web engagement tools and metrics. I will also explain why researchers have developed these tools and the impact these tools have on improving online web engagement

RUNNER UP AWARD



Logan Olesen

Olesen, Logan. "Sand Fraction Lithology Methods to Analyze Archaeological Sediments in Grand Portage, Minnesota."

In this presentation I will be showing the methods that I used to analyze the samples of sand from Grand Portage, MN. This presentation will also cover why this particular location of Grand Portage is an important archaeological site to research these sediment layers. I hope that my data will distinguish that these two sediment layers are either from the same depositional environment or they are not. While this project will resume throughout the rest of the semester I plan on showing preliminary results on this poster.

THIRD PLACE AWARD



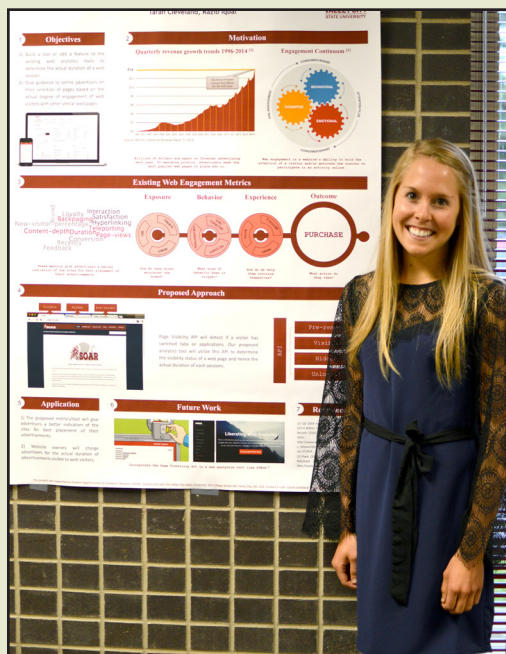
Kaylee Johnson



Cassy Gilbertson

Johnson, Kaylee and Cassy Gilbertson. "3D Printer Presentation: Presenting information on how to integrate technology into interdisciplinary K-12 curriculum."

We will present images and samples via a PowerPoint presentation, while displaying physical examples of 3D projects and classroom lessons. We will also be there to answer questions and further the discussion on the importance of Art and Technology in the contemporary classroom.



Highlighted in this edition of *The Viking Scholar* for Scholar Symposium recipient is Tarah Cleveland:

Tarah Cleveland is a senior from Menahga, Minnesota. She will graduate from Valley City State University in May, 2016 with a major in Software Engineering and a minor in Computer Science. Tarah is also certified in Enterprise Applications. In September 2016, Tarah accepted a job offer from Target Corporation as a software engineer where she will begin working in June, 2016. Tarah's participation in the Student Scholar Symposium in 2015 motivated her to do self-directed research. Not only did she become a stronger researcher, writer, and presenter, but gained valuable knowledge on web visitor engagement through her study. In her job interview at Target, she was able to discuss her research project. Her interviewers were really impressed! VCSU does an amazing job encouraging students to be involved in academic events such as the Symposium.

III. Student Presentations

Dedicated faculty at Valley City State University inspire their students toward excellence. One of the ways faculty do this is to mentor and encourage students to submit research to regional and national professional conferences or other venues. This section highlights the depth and breadth of student presentations over the 2014-15 academic year.



Highlighted in this edition of *The Viking Scholar* for Student Presentations is Cassandra Reidburn.

Cassandra Reidburn is a sophomore from Jamestown, North Dakota. She will graduate from Valley City State University in the Spring of 2019 with degree in both Music Education and Social Science Education. She plans to be a full-time social science teacher along with running the marching band. The chance to write and present a paper at a conference this early in her school career has been extremely beneficial. She was given the chance to learn more about the devastating floods here in North Dakota through the paper. It fit in well at the Dakota History Conference in South Dakota. For her work, Cassandra was recognized with the Western Studies Award for best undergraduate paper. There is a lot to learn from presenting your findings in front of other people in your field. There is no greater school to get these opportunities from than VCSU.

Carlson, Bradley and Jonah Rosin. "Cold War Comes to North Dakota." Dakota History Conference, Sioux Falls, SD (April, 2015).

Between the years of 1962 and 1975, North Dakota was a major asset to the United States. Its isolation made the state an ideal location to have nuclear missiles hidden throughout the state. North Dakota had two Air Force bases established during the Cold War, the Grand Forks and Minot Air Force bases. Both of these bases were each in control of fifteen military outposts. Each of the individual outposts were in control of ten nuclear missiles. Some of the outposts since the ending of the Cold War are closed, turned into houses, or museums.

Hecker, Garret and Jerzy Bilski¹. "Environmental toxicology and coal fly ash chemical composition." Undergraduate Student in Biology. North Dakota Institutional Development Award (IDeA) Network for Biological Research Excellence (INBRE) Annual Meeting, Grand Forks, ND. (October, 2014).

It is widely known that Fly Ash particles emitted from coal-fired plants contain several toxic trace metals. On the other hand, due to the availability of large quantity of FA and the presence of high concentrations of Ca and Mg in most FA sources, FA appears to be a suitable soil amendment for limiting purposes and to enhance Ca and Mg contents in the soil. FA utilization as a soil amendment indicates the necessity to take precautions against the excessive accumulation of heavy metals by plants grown on a media with coal FA.

The diversity of chemical properties among FA suggests that every use of FA as a soil amendment should follow its detailed chemical analysis because it has been established that leachate from places with high concentration of FA may affect water supply. Pollutants associated with FA include several elements (Al, As, Cd, Cr, Cu, Hg, Ni, Pb, and V) whose excessive presence in the environment may become toxic. In this study we discuss environmental toxicology of listed above trace elements present in coal ash. We compared the concentrations of these elements to the levels present in the soil, and diverse water sources. Based on these comparison, we speculated about the environmental safety of coal FA as a material to be utilized as plant growth media.

Hecker, Garret and Jerzy Bilski¹. "Environmental toxicology and coal fly ash chemical composition." *Research Journal of Chemical and Environmental Sciences*, 2014, Volume 2, Issue 4, pp. 27-33.

Mering, Ray. "A Battle of Two Kinds of Americans Embodied by their Leaders." Dakota History Conference, Sioux Falls, SD (April, 2015).

This paper focuses on the leaders of the Battle of Little Big Horn and how they were clear representatives of the culture of each faction, and how they reflected the reasons for the conflict, as well as how the leaders reflected the cultural values of their nations. To make this point, I will give a brief history of the Plains Indian conflict and how it led to the Battle of the Little Big Horn, short biographies of Custer, Crazy Horse and Sitting Bull, and how they each reflected their nations, and the reasons their cultures were at conflict with one another. I shall also survey the aftermath of the battle, covering the thoughts and feelings of both sides, and how it ultimately led to the end of the conflict.

Reidburn, Cassandra. "The Politics of Flooding in North Dakota." Dakota History Conference, Sioux Falls, SD (April, 2015).

The nation watched in 1997, 2009, and again in 2011 while North Dakota battled against Mother Nature and the brutal floodwaters. The flooding in these years had many substantial impacts on this state, such as property damage, relocation, cost, and how to deal with all of these issues. North Dakota as a state and its towns and counties must find a way to recover and prevent this from happening again.

Tangen, Justin; Shannon Dawn Hone; Richard Langdeaux and Jerzy Bilski¹. "Combining phytoremediation of coal fly ash (FA) and agronomic biofortification." Undergraduate Student Biology North Dakota Academy of Science Annual Meeting, Grand Forks, ND (October, 2014).

Coal fly ash (FA) is a major industrial by-product from electric power plants. Disposal of FA is becoming a major issue because of the potential to contaminate air, surface, and groundwater with arsenic, boron, heavy metals, sulphate anions, etc. A promising solution to the FA issue is phytoremediation, the use of green plants to clean up our environment. In our research project we will attempt to combine phytoremediation with the exploration of the possibility to bio fortify cereal crops grown on FA with Fe, Zn, and Se.

Combining FA phytoremediation with agronomic biofortification is a very important issue because Fe, Zn, and Se deficiencies are not only serious public health issues, but also important soil constraints to crop production. This is particularly true in the developing world.

Exploiting the genetic variability and biotechnological approach (e.g., genetic modifications) to the development of plants with high Fe, Zn, and Se content may be an efficient method to improve human nutrition, but, unfortunately, it is not cost effective and requires significant amount of time. Agronomic approaches, proposed in this study, such as application of FA based plant growth media containing high concentration of Fe, Zn, and Se, called "agronomic biofortification" seems to be a cost-effective, fast and practical method to enhance Fe, Zn, and Se concentration in cereal crops.

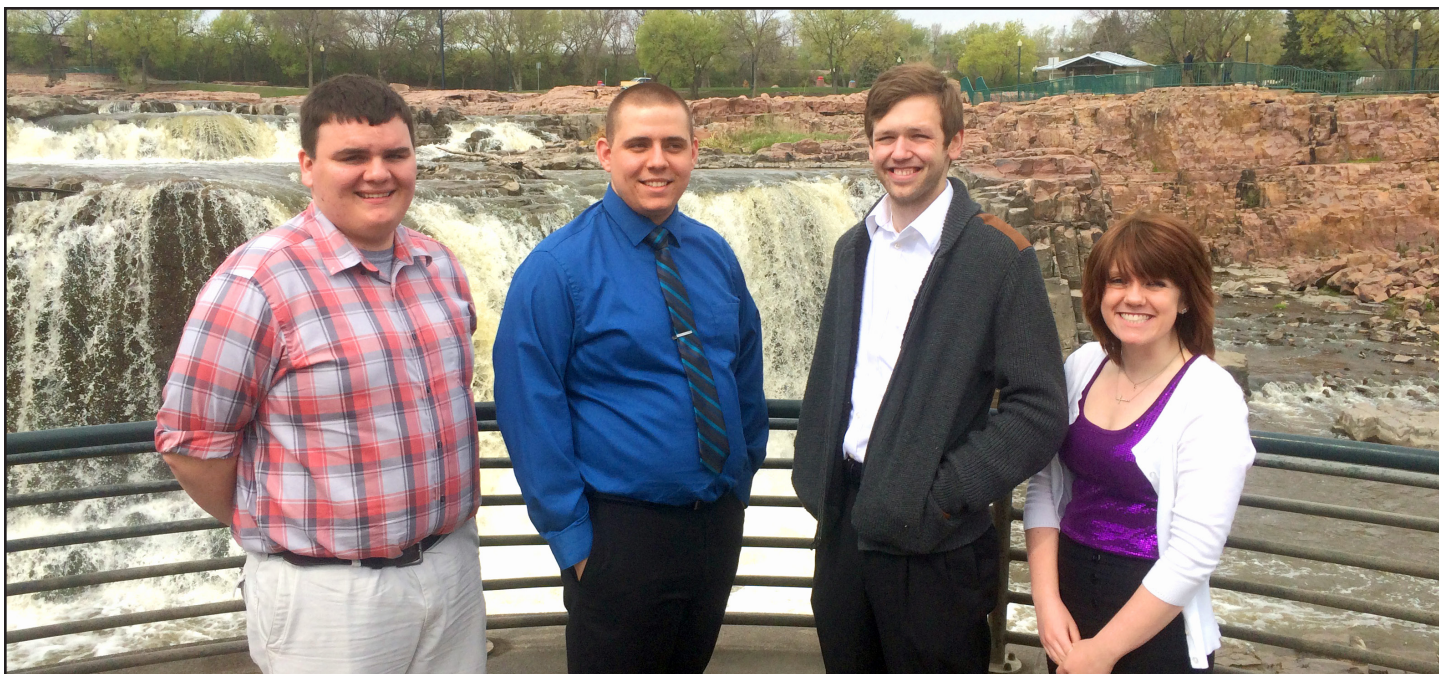
Supported by North Dakota INBRE Grant Number P820GM103422-13 from the National Institutes of Health.



Justin Tangen



Richard Langdeaux



Pictured in front of the Falls are four students who attended the Dakota History Conference in Sioux Falls, SD.
L to R: Jonah Rosin, Bradley Carlson, Ray Mering and Cassandra Reidburn.



Corina Todoran

Todoran, Corina; Elizabeth Maher; Florijin D. Salajan and Brent Hill. (Graduate School Student)

“European Funding Requirements in the eLearning Programme’s.” College of Human Development and Education Ninth Annual Research Showcase, North Dakota State University, Fargo, ND (April, 2015)

In recent years, with the gradual consolidation of ICT implementation and expansion in Education, research on aspects of eLearning ranging from policy development, quality assessment, effective utilization and implementation strategies to key pedagogical implications has grown and diversified. The present study is situated in the context of a growing body of research literature on comparative perspectives regarding the problems and successes of eLearning policies and strategies undertaken in various national and cross-national settings, with a particular focus on the European Union.

Poster: Our research won the People’s Choice Award.

¹The INBRE funded research being conducted at Valley City State University (VCSU) since 2009 is oriented on environmental health aspects of coal fly ash utilization for plant media. It focuses on the utilization of coal fly ash (FA), a coal combustion residue, for growing and cultivating plants, the uptake of metals from FA based plant growth media, and phytoremediation of FA. This project focuses on the potential to dispose of FA in an environmentally safe manner through the use of phytoremediation with cover crops that can be used for biofuel.



IV. Faculty and Staff Publications and Presentations

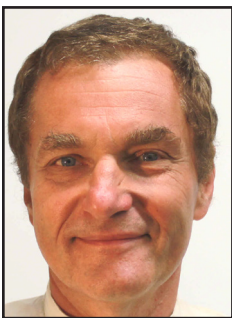
Faculty and staff across campus engage in research to present at conferences or for publication. The following represents faculty publications and conference presentations during the 2014-15 academic year.



Highlighted in this edition of *The Viking Scholar* for Faculty and Staff Publications and Presentations is Dr. Luis da Vinha:

Born and raised in New Jersey, Luis da Vinha moved to Europe in 1993 to study at the University of Coimbra. He obtained a BA and MA in Geography at the School of Humanities and a PhD in International Relations at the School of Economics. Over the past 15 years Luis da Vinha worked as a professional geographer on several spatial planning and development projects in Europe and was involved in politics, namely holding public office. Da Vinha's academic career began in 2009 while a doctorate candidate at the University of Coimbra. He was responsible for teaching two seminar classes at the Department of International Relations (University of Coimbra) and was an adjunct professor at the Higher Institute for Educational Sciences. After completing his PhD in 2014, da Vinha came to Valley City State University to take up a teaching position in the Social Science Department where he teaches courses in Geography and Political Science and continues his research activities. Da Vinha's research has focused on bridging the fields of Geography and International Relations. His main research is framed within the geographic mental map research agenda and emphasizes the relationship between decision-makers geographic representations and

foreign policy-making. The results of these scholarly endeavors have been published in several book chapters, journal articles, and working papers, as well as presented at various international conferences. Da Vinha's most recent publications highlight geography's role in influencing foreign policy decision-making. The results of his doctoral studies will be published by VCSU later this year. Currently, da Vinha is beginning a research project which analyzes the geographic dimensions of international state-building. The project will provide a comparative study of five international peace-building operations, highlighting the similarities and differences of the interventions.



Jerzy Bilski

Bilski, Jerzy; Kyle McLean; Fakira Soumaila; Erin McLean and Candace Kraft.

"Aluminum in coal fly ash (FA), in plants grown on FA, and in the leachates from FA." *Research Journal of Chemical and Environmental Sciences*, 2014, Volume 2, Issue 4, pp. 20-26.

Two coal fly ashes (FA), one from Montana semi-bituminous coal and another from North Dakota lignite alone or in combination with bottom ash (BA) from Montana semi-bituminous coal were tested as plant growth media for the following plant species: barley, oats, rye, wheat, regreen; a hybrid between wheatgrass and winter wheat, and triticale; a hybrid between wheat and rye. The concentration of Al in coal ashes and in plant seedlings was determined using Inducted Coupled Plasma Spectrophotometry (ICP).

All tested plant species germinated and grow in FA and/or FA + BA containing media. These data demonstrate that tested plants can grow on media consisting of coal ash, and therefore these plants can be used to cover FA or BA residue piles. In summary, the presence of sphagnum peat moss and soil in coal ash based plant growth media expressed ameliorative role by reducing the presence of Al in plant growth media and in plant seedlings grown on these media, but it did not translate into the decrease of the presence of Al in the leachate from these media. Elevated concentrations of Al in the leachate may cause some environmental health concerns and require further investigations.



J. Gregory Brister

Brister, J. Gregory. "The Modernist Stream of Consciousness and Self-Help." Modern Language Association Conference, Chicago, Illinois (January, 2014.)

I use advertising and popular self-help books, which were sold through national magazines to note that the "stream of consciousness" in "high-modernist" texts by writers like James Joyce and Virginia Woolf was, in fact, prevalent in popular culture.

Brister, J. Gregory. "Teaching Dos Passos' *The 42nd Parallel*: Modernist Form and Self-Historicism." American Literature Association Conference, Washington, D.C. (May 2014)

I presented a paper about how a student could write a self-biography in the style of Dos Passos' Camera Eye" narrative sections.

Brister, J. Gregory. "Sherwood Anderson's *Dark Laughter*: Whiteness and Modernist Fantasy." American Literature Association Conference, Washington, D.C (May, 2014.)
Contributed Presentation.

This essay concerns a novel by a neglected American author. I note that "whiteness" is a category not interrogated by the authors' essentialized view of race in this novel.



Gregory Carlson

Carlson, Gregory D.; Amanda Fickes; John Boucha and David M. DeMuth, Jr..

"Utilizing Freely Available Technologies for Institutional Dashboards." Association for Institutional Research in the Upper Midwest (AIRUM) Conference, Bloomington, MN (November, 2014).

This presentation highlights the synergistic work between offices at Valley City State University aimed at producing web-based dashboard interfaces to inform campus decision making. These interfaces build upon extensive STEM work to create web-based graphical displays featuring student demographic, enrollment trend, and longitudinal survey data, using freely available Google Fusion Tables, Google Charts, and the Google Maps.

da Vinha, Luis. (2015) "Ronald Reagan" in Casey, Steven; Wright, Jonathan (Eds.) *Mental Maps in the Era of Detente and the End of the Cold War 1968-91*. New York: Palgrave-Macmillan, 195-215.

Book chapter providing insight into the mental maps of President Ronald Reagan during the end of the Cold War period, namely highlighting his views on the opportunities and constraints in transforming the superpower conflict.

da Vinha, Luis. (2015) "Communicative Interaction and Foreign Policy Change: Re-evaluating the Carter Administration's Decision-Making Process during the Iranian Revolution" *Portuguese Journal of Political Science*. 5, 99-118.

Scientific article arguing for a re-evaluation of the traditional accounts of foreign policy decision-making during the Iranian Revolution. By adopting findings from organizational theory, the article puts forward an explanation based on an emergent change approach to identify the communicative interaction processes shaping the Carter Administration's policy throughout the Iranian Revolution.

da Vinha, Luis. (2015) "The (Not So) Rapid Deployment Force: Bureaucratic and Political Barriers to Implementing Strategic Change" *Nação e Defesa*. 141, 156-174.

Scientific article analyzing the difficulty in implementing President Carter's decision to create a Rapid Deployment Force (RDF). The article argues that the main impediments to the implementation of the RDF were bureaucratic and political barriers, particularly those resulting from the interagency debate between the NSC and the State Department regarding the nature of détente.

da Vinha, Luis. "The Carter Administration's Emergent Policy in the Middle East: Assessing Foreign Policy Change through an Emergent Change Approach", *European Consortium for Political Research (ECPR) General Conference* (Montreal, Canada, 2015).

Conference paper questioning the traditional explanations regarding the development of the Carter Doctrine based on punctuated equilibrium theory. The paper argues in favor of interpreting the development of the doctrine through the use of emergent/continuous change theories.



Luis da Vinha

da Vinha, Luis. (2014) “Revisiting the Carter Administration’s Human Rights Policy: Understanding Traditional Challenges for Contemporary Foreign Policy” *Revista de Paz y Conflictos*. 7, 99-122.

Scientific article assessing the origins and development of US Human Rights policy under the Carter Administration. The article emphasizes the intrinsic challenges between human rights concerns and issues of realpolitik.

da Vinha, Luis. (2014) “Constructing the Carter Doctrine: Rethinking Foreign Policy Change”, VII Annual Conference of the Portuguese Political Science Association [Coimbra, Portugal].

Conference paper challenging the models of punctuated equilibrium and planned change in foreign policy. The paper highlights the important contributions provided by emergent/continuous change models for understanding policy change.

Freire, Maria Raquel and da Vinha, Luis. (2015) “Política Externa: Modelos, Actores e Dinâmicas” in Freire, Maria Raquel (Org.) *Política Externa: As Relações Internacionais em Mudança* [2nd Edition]. Coimbra: Imprensa da Universidade de Coimbra, 15-61.

Textbook chapter establishing the theoretical and conceptual foundations for the ensuing book chapters by identifying and explaining the different models involved in Foreign Policy Analysis.

Bento-Gonçalves, António; Vieira, António; Ferreira-Leite, Flora and da Vinha, Luis. (2015) “Wildland Fires” in Bento-Gonçalves, António; Vieira, António (Eds.) *Wildland Fires: A Worldwide Reality*. Hauppauge, NY: Nova Science Publishers.

Book chapter addressing the issue of wildland fires, highlighting two of the three most relevant aspects on these issues: i.e., the relationship between wildland fires and climate change and fires in wildland-urban-interface areas.

Ferreira-Leite, Flora; Bento-Gonçalves, António; Vieira, António and da Vinha, Luis. (2015) “Mega-Fires Around the World: A Literature Review” in Bento-Gonçalves, António; Vieira, António (Eds.) *Wildland Fires: A Worldwide Reality*. Hauppauge, NY: Nova Science Publishers.

Book chapter analyzing “mega- fires” which often burn under extreme fire weather conditions and exhibit extreme fire behavior characteristics and exceed all efforts at conventional control, resulting in a very long duration and a very large extent of burnt area.



David Jr. DeMuth

DeMuth, David Jr.. “Makey Makey Workshop at Prairie Region Teacher Training”

The one hour workshop focused on introducing the Makey Makey Innovation Kit for K-12 teachers which was a part of annual Prairie Region Teacher Training event held at Concordia College, Moorhead, MN and hosted by Prairie Public Broadcasting Station. This work was supported by the North Dakota Council on the Arts, assisted by the Inspire Innovation Lab of Moorhead, MN. (June, 2015).

DeMuth David Jr. and Peggy Norris. “Utilizing Technology to Connect Students with Scientists: A Demonstration Videoconference with Sanford Underground Lab” Technology & Innovation in Education (TIE) Conference, Rapid City, SD (April, 2015).

The Dakotas K-12 STEM series utilizes existing high-bandwidth networks to simultaneously connect K-12 classrooms in North and South Dakota, with STEM experts, remote instrumentation and laboratories across the region. In this session, you will be a fly on the wall for a demonstration videoconference between scientists a mile underground at the Sanford Underground Research Facility and middle school classrooms in South and North Dakota. A followup session will describe the program more fully.



Anthony Dutton

Dutton, Anthony. "A splendid example of what bad roads can do for a country': Fly-in Sportfishing and Baja California Sur's First Tourism Complex" Northern Great Plains History Conference - Sioux Falls, SD (September, 2014).

In the late 1960s, the Mexican government articulated a plan to make sand-and-sun tourism the engine for economic growth in outlying, under-developed regions, leading to the development of megaresorts like Yucatan's Cancun. Two decades earlier, the residents of the even more isolated territory of Southern Baja California struck upon tourism as the hope for their own development, creating a small-scale, sustainable and local tourism industry around fly-in sport fishing and centered at La Paz. This tourism complex has been overlooked by historians examining the older urban and resort tourism of Mexico, as well as by those considering the later megaresorts. Despite this oversight, it merits consideration because in the 1960s this model offered a viable approach to regional development. This treatment of the topic incorporates elements of social and economic history, borderlands/transnational issues, and places Baja California Sur in the broader contexts of the history of tourism in Mexico



Emily Fenster

Fenster, Emily A. S. "Triggers and Hindrances: Contextualizing the Retirement Planning Trajectory for Married Individuals." Gerontological Society of America Annual Meeting, Washington D.C. (November, 2014)

This study focused on how pre-retirement married individuals ages 42 or over describe their retirement planning experiences. Data were collected from a sample of 14 married individuals via demographic questionnaires and qualitative in-depth interviews. Analysis utilized a grounded theory approach. Emergent themes addressed how life transitions may trigger or constrain retirement planning. Individuals mentioned certain "firsts" as life events that initiated their planning, such as a first "real" job, getting married, and becoming a parent. Participants also mentioned hindrances in the following areas: family and relationships, employment circumstances, uncertainty and feelings towards the future, and financial decisions or behaviors. These themes resulted in the creation of a timeline to visualize events and behaviors occurring throughout participants' lives that trigger retirement planning, which has not yet been attempted in life course and retirement research. For some, experiences in childhood and young adulthood began to shape their thoughts on planning and motivations for the future, highlighting that retirement planning may begin early.

Ewen, Heidi H.; Jasleen K. Chahal and Emily S. Fenster. "A Portrait of Resilience in Caregiving." *Research in Gerontological Nursing*, 8(1), 29-38.

The current study investigated biopsychosocial resilience in an older adult caregiver. A case study was selected for in-depth exploration of resilience in caregiving identified through biopsychosocial (i.e., salivary cortisol) methods. An exemplar of a woman caring for an adult child dying from a genetic disease is presented in the context of multiple stressors. Significant stress was found to be buffered by cognitive reframing and acceptance of interpersonal limits. Early experiences in caregiving for others with terminal illnesses provided a frame of reference, and difficult family dynamics added a layer of complexity. During periods identified as stressful, cortisol levels rose outside of normal bounds. The study implications are that mixed-methods (i.e., biopsychosocial) studies yield important results on individual differences within similar contexts.



Curt Hill

Hill, Curt and Razib Iqbal. "Musings on LMS, HCI, Clients and Native Programs." Midwest Instruction and Computing Symposium, Grand Forks, ND (April, 2015).

This paper is an essay on some of the latest developments and fads in education. It considers some of the disadvantages of a Learning Management System's gradebook compared to a simple spreadsheet.



Donna James

James, Donna; Brenda Nilson; Rochelle Kovarik; Sarah Kastner and Jana

Gudmundson. “Technologists, principals, teachers + Google Hangout = Common Core implementation” International Society for Technology in Education (ISTE) Conference in Atlanta, GA. (January, 2014).

Donna James is Library Director at Valley City State University, and Director of Collaborate 21, a grant project funded by IMLS. Donna is assisted by an interdisciplinary team of educators from the Park River, ND school district: Brenda Nilson, principal; Rochelle Kovarik, librarian; Sarah Kastner, classroom teacher; Jana Gudmundson, technologist. The team will explain the standards-based Collaborate-21 training model, and demonstrate the on-line curriculum development process, and the tools and applications they used in designing and implementing a standards-based interdisciplinary project in their school. Although the research on the value of collaboration and the grant was my work and I am named as lead, the presentation(s) was made by the K-12 school(s) involved in developing the project(s).



R. Lester Walsh

Walsh, R. Lester and Dale Hoskisson. “Problematic issues in digital storytelling” EdMedia 2015 (Montreal) Proceedings of World Conference on Educational Media & Technology 2015. Chesapeake, VA: AACE.

Storytelling plays an integral role in teaching and learning. With the appearance of digital storytelling (stories created through the tools of interactive media), the presence and scope of storytelling for education is broadened. Traditional and digital stories share certain elements, but a subtle severance impels a comparative discourse as they diverge into distinct art forms. Although technology has transformed storying, a salient framework has been overlooked in the literature. Fundamental predicaments emerge between the making of traditional and digital stories. The divide that separates them reveals dilemmas. The authors contend that these four elements must be present in storymaking whether traditional or digital: thought gathering and planning, portraying the giant, holding personal contact, and taking in the entire audience. In this paper, these four elements are delineated as dilemmas for the digital storyteller.



Dale Hoskisson

Walsh R. Lester; Elizabeth Roumell and Claudette Peterson. “Where have you been, Billy Boy? An inquiry into Filipino transgender culture.” Eighth Asian Diaspora Pre-Conference: Adult Education Research Conference Proceedings, St. Louis, MO (June, 2015).

Filipino transgender adult males comprise a pervasive presence in the Philippines. However, few phenomenological studies have been conducted to investigate their lived experience. By referring to the members of this subculture as Billy Boys, the authors discovered a misnomer. Filipino transgender men refer to themselves as Ladyboys, following the Kathoey culture of Thailand. Unlike the Kathoey culture, however, the Filipino Ladyboys contend with a deeply imbedded Roman Catholic tradition often critical of their subculture. By preparing salient questions and conducting pointed interviews, the researchers sought to create a viable opportunity to examine the Filipino Ladyboys' worldview. Going forward, the authors are preparing their analysis of these collected data to provide East and West perspectives about social norms that occur across cultural thresholds.

Walsh, R. Lester and Dan Clark. “An audience of none: ‘How the Discussion Board has failed us and what we can do about it.’” E-Learn 2014 – World Conference on E-Learning, New Orleans (October, 2014).

The Discussion Board has long been considered the crucible of the online learning environment. Through misappropriation and misuse, however, it tends to resemble an instructional wasteland of superfluous effort and unfulfilled promise. This paper provides a brief history of the evolution of online discussion strategies and practices, a summary of various interactions that occur in the online environment, as well as proposed approaches for fostering effective and useful interactions in the online context.

Walsh, R. Lester; Lane Azure; Karla Witt and Myron Eighmy. “Organizational Prerogatives within Tribal Colleges of the Upper Midwest.” E-Learn 2014 – World Conference on E-Learning, New Orleans (October, 2014).

The organization and administration of Tribal Colleges in North Dakota, South Dakota, and Minnesota stand as an example of historical perseverance. Traditional and time-honored styles of influence coexist with the modern modes of governance. The dichotomous context between systemic beliefs and conventional wisdom mandates that those ignorant of the intricacies of the First Nations of the upper Midwest bivouac outside the cultural circle. Lupton (2007) related that only the invited can begin to perceive the parallels of mitakuye oyasin. The tribal colleges are the gatekeepers of the cultural flame, yet the plains nations must negotiate the hidden curriculum of the dominant culture contiguous to their borders.



Dina Zavala

Zavala, Dina. “Guadalupe Urbán Pen pal as an Authentic Language Learning Strategy.” Foreign Language Association of the Red River Conference, Grand Forks, ND, (March, 2015).

VCSU and the UABCS have been sister universities since 1994, this academic agreement includes yearly student exchange among institutions. In the last two years, the Spanish program at VCSU and the English program at the UABCS have embedded in their curriculum a pen pal exchange among first and second year language students. This exchange has resulted in linguistic and cultural gain among students, which have translated in great classroom discussions on linguistic and cultural issues. Furthermore, this activity has given students the opportunity to practice communication for authentic purposes.



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