



Campus Center, April 26, 2017

-AGENDA-

6:00 p.m. – 6:15 p.m.	Welcoming Remarks	Campus Center Event Room
6:15 p.m. – 6:45 p.m.	Poster Session	Campus Center Event Room

Doctor of Physical Therapy

Master of Arts in American Studies (CC-M5)

Master of Arts in Criminal Justice

Master of Arts in Education

Master of Arts in Instructional Technology

Master of Business Administration

Master of Science in Computational Science

Master of Science in Occupational Therapy

Master of Social Work

Professional Science Master's in Environmental Science

6:45 p.m. – 7:00 p.m.	Announcement of Awards	Campus Center Event Room
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the names in this program are those of graduate student presenters as of April 6, 2017.

-Presentations-

Doctor of Physical Therapy

Mary Kate Geisinger, *Distinguished Research Fellowship Recipient*

Advisor: Dr. Mary Lou Galantino and Dr. Patricia McGinnis

Poster Number: 1

Title: Is there Relationship between Abnormal Pain Sensitivity and Inefficient Endogenous Pain Modulation in Patients with Orofacial Pain. A Longitudinal Study?

The purpose of this research aimed to investigate if abnormal pain processing mechanisms such as heightened pain sensitivity is associated with inefficient endogenous pain modulation in the etiology of symptoms among patients with orofacial pain. Materials/Methods: Quantitative Sensory Tests (QST) are used to objectively assess individual pain processing mechanisms in patients with clinical pain. Quantitative Sensory Tests include Temporal Summation (TS) and Conditioned Pain Modulation (CPM). Temporal Summation is administered to quantitatively assess pain sensitivity secondary to central sensitization process that results from repeated cutaneous stimulation at a painful intensity. In contrast, CPM involves the mechanism of endogenous analgesia, where two painful stimuli are concurrently applied over different body regions to directly assess the central nervous system's ability to modulate pain input. This was done to a convenience sample of patients (n=40) at an initial visit. Results: A strong and positive correlation was found between increased pain sensitivity and inefficient endogenous pain modulation in patients with orofacial pain ($r = 0.69$, $p < 0.001$). No significant association was found between age and gender, including psychological factors and self-reported disability ($p > 0.05$). Conclusion: Heightened pain sensitivity is directly correlated with the central nervous system's inability to effectively modulate pain input, reflecting impairment in the endogenous pain modulation system among patients who seek treatment for orofacial pain. Clinical relevance: Study results provide preliminary evidence on the etiology of symptoms in orofacial pain. Aberrant pain processing mechanisms appear to be significant contributing factors in persistent pain experience among patients with orofacial pain.

Amy Higgins**Advisor:** Dr. Carla Enriquez**Poster Number:** 2**Title:** Interprofessional Education Experience in Colombia, South America: Inquiry to Language Acquisition Skills

irty-one students, 8 faculty and 1 Dean from Physical erapy, Occupational erapy, Communication Disorders, Nursing, Public Health and Bachelor of Health Science programs traveled from Stockton University to Bogota, Colombia in South America. is study continues the interprofessional education (IPE) research by Heckendorn et al. (2016), in addition to qualitative inquiry regarding the in uence of language on the IPE experience. Students were asked to complete pre/post survey using the Interprofessional Collaborator Assessment Rubric (ICAR). Data was analyzed with SPSS 23.0 using a paired t-test with 95% con dence interval. Students completed qualitative questions targeting how language a ected communication in a foreign nation. Seventeen students successfully completed the quantitative assessment and 11 completed the qualitative assessment. irteen quantitative data submissions were excluded from analysis due to incomplete data. In the ICAR, 2/4 sections in the communication category, 1/3 in collaboration, 2/3 in roles and responsibility, 1/2 in team functioning and 3/3 in con ict management/resolution resulted in signi cant change ($p < 0.05$).

Student qualitative frequency of responses revealed di culty communicating with native citizens. is ability improved over the week with the application of body language. Limitations include low response rate and varied results in each section.

is may be the result of the original purpose of the ICAR, which includes directions for grading the performance of a learner. We used this instrument as a self-assessment.

is may have caused confusion in students' responses in the ICAR items. Results demonstrate positive impact of an international IPE experience. Future research regarding language immersion is needed.

Master of Arts in American Studies

Maria Arroyo

Advisor: Dr. Javier Sanchez

Campus Center Meeting Room: 5

Title: Puerto Rican History

This study examined the discrimination Puerto Ricans endured and how they organized to bring about positive change. The Puerto Rican community in America has grown since the 1940's from forty thousand to three point Six eight million, they are the second largest Hispanic group in America. The researcher described the struggles for equality and the hostile environment in which they lived. Music and poems were incorporated in this study that revealed the attitudes and emotions of the Puerto Rican people. White washing history is no longer being tolerated and the histories that have been silenced for so long are making their comeback. As the Puerto Rican saying goes, "Lo que haces en la oscuridad, siempre sale en la luz!"

Kimberly Bylone & Brianna Cardinale

Advisor: Dr. Michelle McDonald and Dr. John O'Hara

Campus Center Meeting Room: 5

Title: MLK and 753 Walnut

This study provides an overview of the results of a research project funded by the New Jersey Department of Environmental Protection, Historic Preservation Office, for a biographical investigation of Martin Luther King, Jr. and the potential significance of 753 Walnut Street, Camden, New Jersey. This is a residence where Martin Luther King, Jr. might have lived, or spent significant amounts of time while a student at Crozer Theological Seminary in Chester, PA, as well as while auditing classes at University of Pennsylvania.

Leslie Wood

Advisor: Dr. Thomas Kinsella

Campus Center Meeting Room: 5

Title: Rebecca Estell Bourgeois Collection

The Rebecca Estell Bourgeois Collection is a donation received by Stockton University by a descendent of the Estell family and housed in the Special Collections area of the school library. The Estells were a well-to-do family in southern New Jersey, with business dealings that included a glass factory, shipbuilding, and land holdings. The Estells were instrumental in the formation of Atlantic County out of parts of Gloucester County in 1837. Rebecca Estell Bourgeois, who the collection is named for, was responsible for the creation of the town of Estell Manor and became its mayor, and the first female mayor in the state, in 1925.

is collection provides a close view of the life of a prominent family and presents several stories associated with the history of southern New Jersey. It follows a well-known family and their business dealings in the glass and shipbuilding industries. It demonstrates the quest for land and the various means used to acquire the land.

e collection also includes personal letters, ephemera, artwork, and other items that suggest other narratives involving the Estells.

Master of Arts in Criminal Justice

Tyler Gelsleichter

Advisor: Dr. Marissa Levy

Poster Number: 3

Title: Elderly Preparedness for Disasters: Mitigation for a Vulnerable Population in New Jersey

Elderly citizens represent an extremely vulnerable population in regards to emergency and disaster preparedness. Older adults are more likely to have chronic health conditions and disabilities than their younger counterparts. In addition to their vulnerability, they face significant issues relating to evacuation and transportation to medical facilities during actual disasters. Nursing homes and 55 and older communities represent areas with high concentrations of elderly individuals. Taking a look at Atlantic County, New Jersey, the author will highlight vulnerable locations containing high concentrations of at-risk elderly. Further, the complexities associated with distance between these elderly residential facilities and hospitals, evacuation routes, and other critical locations will be discussed.

Heather Hogrebe

Advisor: Dr. Marissa Levy

Poster Number: 4

Title: e Impact of Location: Distance of Bars and Drug Treatment Centers and Its Impact on College Campus Drug Offenses

Many college students engage in or have been exposed to drug use during their academic careers. Environmental factors should be considered when exploring what could be influencing the high rates of drug use on college campuses. This current study explores two environmental influences using ArcGIS software. Previous literature and research has indicated that accessibility to bars and drug treatment centers influence college student drug use. Through the use of ArcGis, this study will explore whether easy accessibility of bars create higher drug rates on college campuses, as well as whether easy accessibility of drug treatment centers create lower drug rates on college campuses.

Elissa Vazquez

Advisor: Dr. Marissa Levy

Poster Number: 5

Title: Alcohol Accessibility & Sexual Assault

Many men and women are victims of sexual assault at some point in their lives. For college-aged students, sexual assaults are an issue that leaves many victims in fear of social desirability among their peers. Sexual assaults on college campuses have a variety of factors that can lead to an assault. A few of these circumstances can be underage drinking, peer pressure, or being taken advantage of by someone. Previous literature on the topic of sexual assault among college-aged students tells us that alcohol or intoxication is one of the leading causes of sexual assault. This presentation aims to examine the growing issue of sexual assaults and alcohol accessibility, utilizing aggregated data from college campuses in California. The colleges and alcohol accessibility points will shed light on whether alcohol accessibility near college campuses affects the number of sexual assaults that occur on these campuses. This project will use ArcGIS, mapping software to show the alcohol accessibility and number of sexual assaults reported for the 2014 academic school year in California.

Master of Arts in Education

Kristin Aderholdt

Advisor: Dr. Kimberly Lebak

Table Number: 1

Title: The Impact of Writer's Workshop and the Self-Regulated Strategy Development Writing Model on Students' Ability to Complete Short Constructed Responses

With the introduction of the Common Core State Standards and the Partnership for Assessment of Readiness for College and Careers, there has been an increased emphasis on student writing achievement. The purpose of this study was to examine the effectiveness of two writing models on improving students' ability to complete short-constructed response writing tasks. Aspects of Writer's Workshop and the Self-Regulated Strategy Development (SRSD) writing models were utilized together to help students create meaningful connections between their own goals and increased writing achievement. The participants of this study were twenty students in a seventh grade Language Arts, general education classroom. Throughout the study, writing instruction was taught following the Writer's Workshop model with a strong emphasis on mini-lessons and conferencing. During this process, students developed their own writing goals based on the SRSD writing model and kept track of their goal progression. Student work, rough drafts and final copies, were collected and analyzed through the use of rubrics to measure improvements, as well as additional data, such as videos, reflection logs, student checklists, and teacher notes.

Yvette Anzalone**Advisor:** Dr. Kimberly Lebak**Table Number:** 2**Title:** An Action Research Study Involving Evaluating the Benefits of an Orton-Gillingham Program

The purpose of this action research was to explore the benefits and effectiveness of teaching an Orton-Gillingham, phonics program to eight adolescents and one fourth grade student all with disabilities. A qualitative approach was taken to provide a synthesis and critical analysis of reflective journals, student work samples, recorded video readings, pretest-posttest Fountas and Pinnell reading benchmark results, and pretest-posttest dictation scores. The group of students completed twenty weeks of Orton-Gillingham phonics training, two to three times per week for forty minutes each session. The results were presented through individual student case studies, followed by overall themes that appeared after analysis of data. The results revealed a direct correlation between students who received Orton-Gillingham instruction on a weekly basis and increased reading fluency.

Tanya Arlington**Advisor:** Dr. Kimberly Lebak**Table Number:** 3**Title:** The Power of Two: Co-Teaching in a 5th Grade Mathematics Classroom

The purpose of this action research paper is to examine the effectiveness of the different co-teaching models: one teach, one assist, parallel teaching, alternate teaching, station teaching, and team teaching, on student achievement in a 5th grade math classroom. The focus of this research project centered on 14, 5th grade students with and without learning disabilities, and my co-teacher. The research took place from December of 2016 through February of 2017. In order to determine the effectiveness of co-teaching on student achievement through co-teaching models I collected, coded for themes, and analyzed the following data sources: live video recordings of the class, a student survey, weekly reflection journals, and field notes consisting the different models used weekly as well as discussions with my co-teacher regarding lesson plans, assessments, and classroom teaching. Through analyzing the data, the findings indicate that proper implementation of the co-teaching models, and an increase in planning time leads to an improvement in student achievement.

Marlene Barrera
Advisor:

Steve Cohen**Advisor:** Dr. Kimberly Lebak**Table Number:** 5**Title:** Many Ways In: Increasing the Engagement of Students with Moderate to Severe Disabilities Using a Multisensory Approach

One of the most effective tools in a teacher's arsenal is a multisensory approach to delivering content. Educational research suggests that students with moderate to severe disabilities can particularly benefit from multisensory techniques due to a variety of medical, cognitive, and behavioral needs. This project seeks to take what is purported to be an effective educational method and put it into practice to determine how the theoretical translates to the actual. Five students were recorded on video learning a variety of topics during one baseline lesson, and nine multisensory lessons. Each lesson was limited to no more than twenty minutes and employed kinesthetic, visual, aural, and olfactory activities. Student responses to these lessons were coded according to on-task and off-task behaviors using a modified tool for evaluating and defining engagement. Engagement behaviors were broken down to eight specific indicators describing what constituted a student being on task or off task. Research journals illuminating observations and reactions by the author

Samantha Filangieri**Advisor:** Dr. Priti Haria**Poster Number:** 9**Title:** Systematic Implementation of Transition Routines and Academic Engagement Enhanced Classroom Behaviors of Kindergarteners

The purpose of this research was to examine the role of a teacher in promoting academic engagement and transition routines to improve kindergarteners' on-task behaviors. Eighteen kindergarten students from the expanded day program participated in this study. During story time, the teacher integrated a variety of hands-on activities to engage the students (e.g., use of whiteboards, turn and talk, acting out words, etc.) as well as introduced the use of a timer and specific directions for transitions between parts of the lesson to help students focus on the content. This study presented data that looked at how the teacher successfully facilitated active engagement strategies as well as successful transitions between parts of the lesson. The following data sources were collected and analyzed; reflection logs, video recordings of lessons to capture academic engagement of the students, transition data collection sheets to record the time it took to transition from one activity to the next, and active engagement observation sheets to show how many times students were on-task and off-task during the lesson. The anticipated results of this project might reflect that the implementation of academic engagement strategies and transitions would decrease students' off-task behavior and the increase on-task behavior.

Valerie Flori**Advisor:** Dr. Kimberly Lebak**Table Number:** 9**Title:** Implementing Cooperative Learning Strategies in a Kindergarten Inclusion Classroom to Increase Peer Interactions During Academic Learning Centers

The purpose of this study was to increase peer interactions during student learning centers through the implementation of cooperative learning strategies in a Kindergarten inclusion classroom. This study included three special education students and fifteen general education students. The cooperative learning strategies: think-pair-share, Find Someone Who, Numbered Heads Together, talking chips, and assigning group roles were implemented over a period of 12 weeks. Data sources collected included reflective journals, video recordings, and student surveys.

The reflective journals and video recordings were analyzed to see how often peer interactions occurred and if these interactions were positive or negative. In addition, student surveys were analyzed to determine if students' opinions working with peers improved with the implementation of the cooperative learning strategies. Results showed that peer interactions during students' learning centers increased significantly. Students also showed a greater interest in working with peers after implementing the cooperative learning strategies.

Autumn Logan**Advisor:** Dr. Kimberly Lebak**Table Number: 11****Title:** Alignment and Inclusion of NGSS in High School Biology Lessons

The purpose of this study was to properly analyze high school biology lessons to ensure they align with the Next Generations Science Standards (NGSS) including all three dimensions and performance expectations per each standard. The researcher unpacked each lesson's standards using the NGSS placemat. Lessons were taught in a 10th grade Biology classroom. Utilizing the EQUIP rubric, six recorded teaching videos of the researcher and the lesson plans were analyzed to determine the alignment of those existing lessons to NGSS. The lessons recorded were from a high school biology special education class in New Jersey. Specifically, lessons in the topic areas of: matter and energy transformation in ecosystems, interdependent relationships in ecosystems, and human activity and climate. The researcher focused specifically on the written lesson plans and videos of what was being done in the lesson with the students, and not the actual teaching. The researcher concluded areas from each lesson that were and were not aligned with NGSS and how those lessons could be improved to create better lessons that are completely aligned with the NGSS.

Ingrid Manderson**Advisor:** Dr. Priti Haria**Table Number: 12****Title:** Differentiation of Mathematics in Self-contained Elementary Class

The purpose of this research project was to investigate the impact of differentiated instruction on the learning of elementary school students within a self-contained mathematics classroom. This research takes place in a self-contained classroom that contains both 3rd and 5th grade students through use of interventions and differentiation the anticipated results should demonstrate an improvement in the mathematical comprehension skills of the students.

Alexandra V. Mercado**Advisor:** Dr. Kimberly Lebak**Table Number:** 13**Title:** Improving ELL Literacy & Vocabulary Skills through Peer-Tutoring Interactions

This action research project examined the effects of implementing a supplemental peer-tutoring reading program known as PALS to improve fluency and comprehension. It also examined the effects of daily explicit academic vocabulary instruction to increase phonological awareness for first graders in a transitional bilingual classroom. The intervention group receiving both components of this action study consisted of 11 students of different reading levels. Research was gathered for 12 weeks during a daily 60 minute ELA block. The researcher collected and analyzed pre- and post-vocabulary identification tests data, DIBELS scores and data, running records, as well as bi-weekly academic vocabulary assessments. The researcher also conducted observations and reflected on their own lessons through coded video recorded lessons to determine how students were learning to read fluently with a peer.

Heather Nanos**Advisor:** Dr. Kimberly Lebak**Table Number:** 14**Title:** Using Cooperative Learning Strategies to Increase Student Interaction Among Peers in Language Arts

The purpose of this study was to examine the effects of implementing specific cooperative learning strategies into Language Arts lessons to increase student interaction among peers. This study took place over three months in a special education classroom setting, involving nine students that are on different learning levels. The three cooperative learning strategies that I implemented throughout the three-month period are: Think-Pair-Share, Find Someone Who and Numbered Heads. At the beginning of every month, students were introduced to a new strategy and were provided with a model as to how the strategy would work in the classroom. Next, the students practiced the strategy and worked their way to independently using the strategy to increase their interaction with peers. I collected and analyzed reflective logs, student work samples, video recordings and student self-assessments to determine the effectiveness of using cooperative learning strategies in Language Arts.

The anticipated results may reveal that the implementation of different cooperative learning strategies can increase student interaction among peers. These results may show that one strategy shows more of an increase in the interaction among peers than another cooperative learning strategy.

Ashlee Perna

Tami Schaer

Advisor: Dr. Kimberly Lebak

Poster Number: 12

Title: The Effectiveness of Explicit Instruction, Specifically Explaining and Modeling Core Context, on Students' Ability to Conceptually Understand Middle School Mathematics Concepts

The purpose of this action research was to determine the effectiveness of explicit instruction, specifically explaining and modeling core context on students' ability to conceptually understand middle school mathematics concepts. The study focused on an eighth-grade general education mathematics class, specifically focusing on nine

Dena Sutor**Advisor:** Dr. Kimberly Lebak**Table Number: 18****Title:** Visual Schedules and their benefits with students with Autism Spectrum Disorder (ASD)

Prompt dependency is a common problem for children with intellectual and developmental disabilities and in particular for children with Autism Spectrum Disorder (ASD). Two students with varying levels of Autism in a self-contained special education classroom participated in a study with the goal of promoting independence and completing tasks with minimal or decreased prompting. Visual schedules were picked as an intervention for this particular student to help these students take steps towards being independent while completing tasks. This study examined the numbers and types of prompting needed, and the number of completed tasks. The students were monitored weekly over 11 weeks. Due to variety of work schedules of the students, the skills were targeted specifically during a mathematics period. Data to determine the progress of the students was as collected through video monitoring, reflective journals, and data sheets.

Nicole Sweiderk**Advisor:** Dr. Priti Haria**Poster Number: 14****Title:** Impact of Teaching Six-Syllable Type Strategies on 2nd Graders' Fluency and Retelling Skills

In a second grade intervention reading group, students indicated lack of necessary decoding and word recognition skills. This in turn, impacted their reading fluency and retelling skills. The purpose of the study was to teach four struggling second grade students six-syllable type decoding skills to improve their fluency and retelling skills. Over the course of eight weeks, the Six-Syllable types were explicitly taught during small group reading instruction. The following data sources were collected and analyzed: video recordings of Six-Syllable Type instruction during small group reading, teacher observation and reflection logs, timed pre- and post- fluency tests that had the six-syllable types integrated in the reading, (take 2nT95.6 (atr)10 iTf0 0t smc)gskit

Ersi Tollja**Advisor:** Dr. Priti Haria**Poster Number:** 15**Title:** Secondary Students with Disabilities Use a Three-Level Reading Guide to Analyze Primary Source Documents like Political Cartoons

In social studies, the comprehension of primary source documents, such as political cartoons, require students to effectively identify symbols and images, interpret visual images, and apply interpretive skills to other context and content. The purpose of this research was to improve students' ability to analyze primary sources in a social studies classroom through the use of the three-level reading guide to analyze and evaluate primary sources like political cartoons. This study presents data on the implementation of the three-level reading guide and its effectiveness in improving students' comprehension scores. The following data sources were collected and analyzed: pre- and post- history test focusing on analysis of political cartoons, audio/video recording of lesson, and reflective logs. The research showed that the implementation of the three-level reading guide improved students' ability to identify literal information and to interpret and analyze political cartoons, however students did not show significant growth in applying comprehension skills to analyze other primary sources.

Angela Tepedino**Advisor:** Dr. Kimberly Lebak**Table Number:** 19**Title:** Incorporating Interactive Writing Lessons and Differentiated Writing Instruction to Improve Students' Ability to Independently Write Coherent Sentences in a First Grade, Special Education Classroom.

This action research project explored the effects of the implementation of differentiated, interactive writing lessons with a group of first grade, special education students. The main goal of this project was for the students to enhance their ability to independently write sentences along with creating coherent sentences that are on topic and mechanically correct. Four students representing different academic readiness participated in the study. One group was an on-level group and the other was a below-level group. Before implementing the main part of this action plan, the

Kelsey Thompson

Advisor: Dr. Priti Haria

Poster Number: 16

Title: Integration of Multi-Sensory Instruction: Enhances Comprehension Skills of Elementary Students with Learning Disabilities

The purpose of this study was to determine the effects multi-sensory instruction (visual, sensory, auditory, and kinesthetic) on reading comprehension skills (inferences, context clues, and main idea) of the elementary readers. The participants used in this study were nine third and fifth grade students with learning disabilities and basic skill needs. Instruction was implemented four times a week for forty minutes each. Data was collected through teacher observations/reflections, video recordings, pre- and post-reading questionnaires, and a pre- and post- comprehension test. The results revealed that the multi-sensory teaching method (visual, auditory, sensory, and kinesthetic) improved student's reading comprehension skills, especially in identifying the main idea, making inferences, and using context clues.

Brittany Wallace

Advisor: Dr. Kimberly Lebak

Table Number: 20

Title: Increasing Independence in Students with Autism through the Use of Picture Schedules

A common practice for teachers of students with autism who are nonverbal is infusing the use of Picture Exchange Communication Systems (PECS) in the classroom. It is believed that the use of PECS can increase communication and comprehension while simultaneously decreasing problematic behaviors. Picture schedules have also been used to assist students in increasing independence in daily tasks, which is a common concern of families of individuals with autism. This work examines the effectiveness of picture schedules for three students with autism with the goal of increasing vocational independence. The level of independence on each task was recorded for each student weekly and the results were compared to baseline data. The results indicated that the students in this study did not significantly benefit from the use of picture schedules in regard to vocational tasks.

Master of Arts in Instructional Technology

Cindy Crager

Advisor: Dr. Jung Lee

Easel Number: 1

Title: Question Prompts for Foundation Scholarship Essays

The purpose of this research study was to explore the effects that essay question prompts would have on the Stockton Foundation application essay. The scholarship applicants did not have specific guidance on what to include in the scholarship essay.

This led to applicant confusion and a lack of confidence in the essay submission. Utilizing three assessments, interview, focus group, and survey, the scholarship administration team constructed revised essay question prompts. Results showed that those who had previously submitted a scholarship essay tended to reuse the same essay from the prior year; however, those applicants who submitted essays for the first time were much more inclined to follow the question prompts. All qualified applicants were surveyed about the effect of the question prompts on their essay. Over 80% of the survey respondents found the question prompts either extremely or very useful while writing their essay.

Michael V. Cuomo

Advisor: Dr. Jung Lee

Easel Number: 2

Title: Instructor Moderation Strategies to Improve Critical Thinking in Online Discussions

The purpose of this research study was to explore how to increase critical thinking among students within online classroom discussions through discussion design and instructor intervention strategies. This was motivated by findings that the adoption of online discussions are rising but those discussions often lack quality since students' responses only share facts, lack coherence and depth, and often repeat points already made. For the purposes of this study, a higher quality discussion was equated with one that incorporated the higher levels of critical thinking described in Bloom's Taxonomy. After an extensive review of literature on discussion design and moderating techniques, the author adapted an approach from DeLoach and Greenlaw in which instructors intervene by helping students transition from one level to the next of Bloom's Taxonomy or when a conflict arises. For this study, Undergraduate students at Stockton University were asked to complete four discussions, two unmoderated discussions and two moderated discussions, to compare the quality of students' responses with and without the intervention technique. Although the study is still ongoing, preliminary findings have highlighted some severe limitations in terms of student participation which means the results are inconclusive. However, the author discusses areas of improvement for future studies on this topic.

Amanda DeVita**Advisor:** Dr. Jung Lee**Easel Number:** 3**Title:** Increasing Motivation in Writing through Technology

Students in a 4th grade classroom were having difficulty understanding how to organize their writing and struggling to stay focused on their topic. To correct this issue, technology was infused into a writing and social studies unit. By incorporating technology into the lesson, I motivated the students for the desired writing outcome I expected. Students researched a county in New Jersey and used images from their county to help organize their report. Students were given a needs analysis survey to understand their perception of writing and their comfort with the use of technology. Since the students were motivated using technology, I incorporated technology within each lesson. Students were using Google Images, Google Slides, and Google Docs to help support their writing throughout this unit. Students completed their project with an Augmented Reality presentation that they then shared with the class. Based on the results from my needs analysis survey, pre-writing task, and post survey, students' writing and their attitude towards writing showed improvement.

Dana Engle**Advisor:** Dr. Jung Lee**Easel Number:** 4**Title:** Stockton Seaview Reference Website: A Resource for Stockton University Employees

Stockton University purchased the historic Seaview Hotel & Golf Club in August 2010 and utilizes the property on a regular basis. As a benefit to this acquisition, Stockton employees are offered discounts on hotel rooms, dining, and golf for personal use as well as special rates and procedures for university-related conferences and travel. However, many employees were not fully aware of these benefits and there was nowhere to view this information in times of need.

The purpose of this study was to see if creating one centralized location would give employees a better understanding of the relationship between Stockton and Seaview and serve as a resource for the various benefits and opportunities available. A website was developed that was tailored to University needs and usage of Seaview including general property information, discount policies, frequently asked questions, and booking inquiry forms that would serve as an on demand resource.

Through research, I learned how to best compile the information website so that it would be an effective and visually pleasing resource for the viewer. The proper resource for employees would provide benefits that are two-fold, educating the Stockton community and providing a job aide, which will in turn allow Seaview to better serve their needs and meet their expectations.

Rachelle Fialho**Advisor:** Dr. Jung Lee**Easel Number:** 5**Title:** Gamification in the Classroom

Millville High school district offers driver's education to sophomores within the health education curriculum. The previous curriculum was filled with detailed instruction presented in lecture form and then students were tested for retention and understanding. Forty, tenth grade students displayed a lack of knowledge of the roadway rules and regulations in accordance to the New Jersey driver manual based on a standard pretest. An action plan was developed to explore gamification in my driver's education curriculum in order to create an active learning environment in the classroom and in turn increase test scores. The use of gaming strategies is believed to increase engagement in the classroom, boost enthusiasm for learning and hold student's attention. Therefore, three gaming tools were integrated into the chapter lessons. Using online gaming tools, like Kahoot, Socrative and arcade games, students were able to study the content at their leisure and their proficiency were assessed throughout the course. At the end of the course, participants were given the New Jersey State Driver's written exam and a Likert scale survey. Based on the survey results, the reaction to integrating gamification within the curriculum was overall positive and students preferred this type of instruction. Also, evaluation results revealed a 40.5% increase in total performance scores demonstrating the success of this intervention project.

Julie Fulton**Advisor:** Dr. Jung Lee**Easel Number:** 6**Title:** Visual Design Tutorials for Online Courses

Visual design plays an important role in online courses by helping the learner to engage with the content and navigate through the course efficiently. In a survey of online courses at a university, visual design elements were used in varying degrees within the course management system. Some courses included elements such as graphics, colors, and other visuals to highlight the content, while others used very few visual elements. An interview with the university Fellow for Online and Hybrid Courses also revealed that many instructors were not aware of the design options available.

Nancy Gandy**Advisor:** Dr. Jung Lee**Easel Number:** 7**Title:** Using Images and Technology to Organize and Motivate Writing

The purpose of this research study was to improve the organization of writing pieces. The Partnership for Assessment of Readiness for College and Careers test (PARCC) requires that the students write in an organized way where like ideas are grouped together. Fourth graders have difficulty expressing their thoughts on paper because their thoughts are scrambled and not in an organized manner. This project introduced writing through images. Since students enjoy using the internet and can easily interpret what a picture is about, I decided to use images to guide and organize their writings. After students researched a county in New Jersey to find out about its history, geography, population, and size, they used Google slides to organize the photos they collected from the internet and from experts from their county. The slides were used to create a video narration of their research. Once their narrated movie was complete, students used the movie and slides as a guide to create an organized report about their county. In comparison to last year's fourth graders, this project increased the rubric scores by 1.5 points.

Brielle Giambri**Advisor:** Dr. Jung Lee**Easel Number:** 8**Title:** The Use of Story Mapping to Differentiate Instruction to Meet the Needs of the Struggling Learner in the First Grade Classroom

The New Jersey English Language Arts Common Core standards require students to retell a story using key details from the text by the end of first grade. This is a hard task for the struggling learner. The purpose of this research study was to explore the use of story mapping as a differentiation tool to meet the needs of the struggling learner and provide them with the necessary skills to retell a story using key details. It was hypothesized that if students are provided a story mapping intervention, they will be able to complete a story map and use the information to retell a fiction story. As a result of this story mapping intervention, all but one student increased their retelling score from a needs work skill level to skilled. One student increased their retelling score from a needs work skill level to developing.

Christina Kelley**Advisor:** Dr. Jung Lee**Easel Number:** 9**Title:** Wired & Inspired: A Before/After School Workshop Integrating Collaboration and Storytelling

With the addition of 1-to-1 Chromebooks in grades 3-5 and the district using G-Suite for Education in the 2016-2017 school year, teachers at a southern New Jersey elementary school desired more resources and training regarding those devices and programs. This project sought to engage and inspire teachers to use and incorporate technology in their classrooms with the creation of a before/after school workshop called “Wired & Inspired.” The workshop was based on the concept of “storytelling.” By teachers telling the stories of things that worked (“stars”) and things they were in need of (“wishes”) in their classrooms, teachers would collaborate among the staff to be more comfortable to use technology and find solutions for their classrooms regarding technology. Using a pre-survey, monthly surveys, a mid-term survey, and a post-survey, teachers voiced that “Wired & Inspired” helped them share ideas and incorporate technology into their classrooms.

Jessica Ann Kowal**Advisor:** Dr. Jung Lee**Easel Number:** 10**Title:** ElevateStockton Project Leader Training Program

In 2015 the University Foundation implemented Stockton's first crowdfunding platform called ElevateStockton by utilizing the subscription-based digital fundraising software ScaleFunder. ElevateStockton project leaders are responsible for all user interface with the platform in order to create and complete a crowdfunding campaign. However, ElevateStockton project leaders all had varying degrees of anxiety around the user interface with the Scalefunder software platform which was preventing them from using it. Crowdfunding campaigns for ElevateStockton cannot be completed without project leaders. The purpose of this project was to provide a training program to project leaders that would improve their ability to utilize the ScaleFunder software platform and reduce their anxiety. The comprehensive computer-based multimedia training program provided a transactive communication learning approach and a

Elsann Machotka

Advisor: Dr. Jung Lee

Easel Number: 11

Title: Student-Generated Question-Based Study Guides through a Scaffolded Model

Many students in high school struggle with developing effective independent study skills. One of the underlying issues is that those students were rarely formally

April G. Perrone

Advisor: Dr. Jung Lee

Easel Number: 13

Title: Implicit Bias and the Courts: A Vicinage 1 Study

Implicit bias presents challenges because of its very nature as a hidden, not known-to-the-self phenomenon. It shares connections with ideas about prejudice, stereotypes

Jennifer Salvati

Advisor: Dr. Jung Lee

Easel Number: 15

Title: The Decline of Parental Involvement in Middle Schools: A Study on How to Encourage Involvement

The purpose of this research study was to examine parental involvement in a low socioeconomic middle school. There is a sharp decline in parental involvement once students enter sixth grade. By focusing on Epstein's Framework of Six Types of Parental Involvement, with a strong focus on communicating, volunteering, and decision making, this study set out to increase parental involvement. A new Parent Teacher Organization was established along with a corresponding website. Meetings were held on various days of the week at varying times and streamed live on social media to ensure inclusion of as many parents as possible. Workshops were held for

Tracy Stuart**Advisor:** Dr. Jung Lee**Easel Number:** 17**Title:** Addressing Community Policing Deficiencies through Education

Community Policing is a philosophy that is highly endorsed by the administrators of campus police departments. Getting to know the community fosters trust and builds citizen support for the police. Despite administrative emphasis on the expectation of engaging in community policing, a large percentage of a campus police department's sworn officers are scarcely participating. The ability to successfully fulfill the duties of a law enforcement officer often depends on proper, comprehensive training. The objective of this study was to examine the effects of educating these campus police officers on community policing. In proposing a training workshop, the researcher aimed to answer the following questions: 1) would establishing the relevancy of this policing approach lead to an increase in active participation? 2) would facilitating a team alignment session prompt officers to reflect upon ways they can better meet department expectations? In order to improve the chances of yielding positive results to those questions, the researcher designed and executed a workshop aimed at generating both intrinsic and extrinsic motivation. It included expert speakers, real-life examples, engaging visual aids and evaluation questionnaires. The results of the preliminary evaluation indicated that all sworn officers had a basic understanding of the subject. Contrary to police department records, all but one conveyed that they willingly, actively participate in community policing. Closing feedback revealed that the overwhelming majority found the workshop to be worthwhile and that they would almost certainly increase their involvement in this essential area of police work.

Donna Terry**Advisor:** Dr. Jung Lee**Easel Number:** 18**Title:** Differentiated Instruction, Technology Assisted Instruction and Aural Perception in the Elementary Music Classroom

Students in the third, fourth and fifth grades regularly performed in the school chorus. Some beginning chorus students, mostly third graders, had difficulty hearing relationships in tonal and rhythmic patterns, thus often had difficulty performing patterns in the context of choral repertoire. The deficiency in tonal and rhythmic aural perception led to inaccurate singing, especially when first exposed to a piece of music. Listeners became acutely aware of these students because their performance was markedly different from the group and they were often labeled "monotone" or "tone deaf." Students in this school received general music instruction and choral music instruction once per week for forty minutes each delivered in a whole group setting, with little opportunity for differentiation and individual feedback. By creating centers in general music class, differentiated instruction and technology-assisted instruction focused on aural skill development were applied during weekly third grade general music classes. Students were organized into groups based on the results of their music aptitude assessment, and rotated through four centers,

spending more instructional time in one center designed specifically for their needs. The centers utilized technology assisted instruction, such as interactive websites and Apple applications for the iPad. A teacher assessment center was developed, utilizing visual and kinesthetic tools, providing individual instruction, feedback and assessment. Two out of the three third grade classes participated in these centers, while the other class continued to receive whole group instruction for the length of this study. Evaluation showed an increase in aural skills for all classes, however the classes receiving differentiated and individual technology assisted instruction demonstrated a greater increase.

Monica Viani

Advisor: Dr. Jung Lee

Easel Number: 19

Title: Food Assistance Team Instructional Site

Stockton University's Food Assistance Program was launched in the Fall of 2015. A committee was assembled from various offices within the Division of Student Affairs. While the program has grown and several students have benefited from it, there appeared to be some misunderstanding on the exact procedures of the program. With

Master of Business Administration

DJ Dinnebeil

Advisor: Dr. Diane Holtzman

Table Number: 21

Title: "I Manager" Project

The "I Manager" project is a self-critical and self-reflective exercise for students

Master of Science in Communication Disorders

Shannon Dolcy & Corey Hanson

Advisor: Dr. Monika Pawlowska

Poster Number: 17

Title: A Client's Perspective of Puberphonia/Mutational Falsetto

The purpose of this research was to provide an in-depth literature review of the current understanding of the voice disorder puberphonia/mutational falsetto. Puberphonia is a voice disorder that is primarily studied globally, with India leading the research efforts. The disorder is not well known or researched in the United States leaving clinicians with minimal evidence based practice to guide them in treatment. We provide an overview as to what puberphonia is and how it presents clinically. Current research focuses on case studies of specific treatment approaches or assessment protocols (singing therapy, traditional voice therapy, electrolyngography, real time visual feedback, vocal aerodynamics, and various surgical procedures on the larynx) used to treat the disorder. There are no current studies found that detail the client's perspective of the disorder and treatment process which is the path our research will be taking.

Rebecca Nesterwitz

Advisor: Dr. Monika Pawlowska

Poster Number: 18

Title: Assessment and Treatment of Phonological Disorders in Preschool Children in New Jersey

Phonological disorders are important to identify and treat in the preschool years because postponing treatment until a child enters elementary school can cause significant delays in phonological awareness and literacy skills. However, in New Jersey, if the phonological disorder is not severe enough to classify the child as "preschool disabled," the disorder may be left untreated. This study aimed to identify the extent to which preschool children are receiving evaluations and treatment for phonological disorders in NJ schools and to assess how familiar school-based SLPs are with current evidence-based treatment approaches for phonological disorders. The study utilized an online survey, which was completed by 52 participants, all preschool-based SLPs in NJ. The survey contained questions about relevant demographic and background information, current knowledge and beliefs about phonological disorders, as well as questions regarding familiarity with current evidence-based treatment approaches for phonological disorders. Information about eligibility criteria and a protocol for children who do not meet these criteria, but still are in need of intervention, was also collected. The study found inconsistencies in eligibility criteria, clinicians' familiarity with treatment approaches and beliefs about the need for services. On the other hand, participants consistently expressed a need for continuing education courses in the area of phonology.

Master of Science in Computational Science

Brian Cicali, *Distinguished Research Fellowship Recipient*

Advisor: Dr. Robert Olsen

Poster Number: 19

Title: Computational Drug Discovery: A Comparative Study using MAPK-Specific Melanoma Therapies

Melanoma is the deadliest form of skin cancer, killing more than 10,000 people annually in the United States. Although multiple FDA-approved therapies exist, melanoma is still a very serious form of cancer. This project centers on the computational modeling for potential combination melanoma therapies. The therapies examined in this project are drugs that target proteins within the mitogen-activated protein kinase (MAPK) pathway. The MAPK pathway is involved in many cellular functions and mutations in this pathway are associated with melanoma development as well as other forms of cancer, such as lung and breast cancer. This particular project focuses on a computational examination of the potential synergistic effects of combining melanoma therapies that target a portion of the MAPK pathway. To perform this project

Melissa Laurino & Tarak Pandya**Advisor:** Dr. Russ Manson Dr. John Mick**Poster Number:** 21**Title:** Investigating Trends and Patterns of Surface Water Temperature in Bottlenose Dolphins (*Tursiops Truncatus*) of Cape May, New Jersey

Water temperature can affect bottlenose dolphins, *Tursiops truncatus*, by influencing their migration, prey distribution and species interactions. The population in Cape May, New Jersey utilizes the habitat as their feeding, mating and birthing ground in the spring, summer and fall months. Opportunistic data collection by the Cape May Whale Watch and Research Center from March to November in 2015 and 2016 demonstrates a temperature range for an abundance of feeding and mating behaviors, as well as the presence of calves and herds. Results are presented with computational software including Python, R, Tableau and other geographic mapping libraries. Applications in machine learning, statistics and other algorithms were explored to determine the significance of results. Improved understanding of habitat utilization relating to surface water temperature in this region can further improve our knowledge of how this species responds to their environment in influencing migration and other behaviors.

Tarak Pandya**Advisor:** Dr. Clifton Baldwin**Poster Number:** 22**Title:** Identifying which U.S. Hospital Regions Receive Higher Wages from Ambulatory Payment Classifications (APCs) by Using SAS Programming Software.

Ambulatory payment classifications (APCs) are subcategories of the United States government's method of paying for Outpatient prospective payment system (OPPS), an outpatient facility services for the Medicare program for citizens ages 65 and older. This program is part of Centers for Medicare and Medicaid Services (CMS) helps senior citizens and children with permanent disabilities obtain better healthcare services. All services paid under OPPS are classified into APC groups. The APCs divide all outpatient services into almost 600 procedural groups which can be indicated as levels. APC payments are made to the hospitals when the Medicare outpatient is discharged from the Emergency Department or clinic, or is transferred to another hospital (or other facility) which is not affiliated with the initial hospital where the patient received outpatient services. The method of payment is based on Inpatient Prospective Payment System (IPPS) adjusted wage index and geographical adjustment factor. This service provides benefits to patients and reimburses hospitals at the expected calculated rate for their services in a given APC instead of the actual costs incurred. The major objective of this study is to find out which U.S. hospital regions are receiving higher wages from the APC system based on various levels of treatments provided by hospitals, and which levels are commonly seen throughout the U.S. This study was conducted using SAS (Statistical Analytics Systems) software's graphics procedures and data was obtained from cms.gov.

Master of Science in Occupational Therapy

Katherine Austin, Kristy Beohmer, Mary-Kate Fitzpatrick, Kristina Lucci, Mackenzie Pezzi, & Lindsay Stanewich

Advisor: Dr. Victoria Schindler

Poster Number: 23

Title: Measuring Occupational Therapy Students' Comfort with the Mental Health Population

The purpose of the study was to measure occupational therapy students' comfort with and perception of the mental health population pre and post completion of a 2.5 years Master of Science in Occupational Therapy program. The participants consisted of 29 graduate students (27 females, 2 males) at Stockton University. This one group pretest, posttest design used two self-report assessments, the Opening Minds Scale and OT Student Comfort Scale to obtain both quantitative and qualitative data on student comfort and experience with individuals with psychiatric disabilities. The data was analyzed using SPSS and qualitative analysis.

Andrew Bishop, Meg Dmuchowski, Ashley Johnston, Richelle Roth, & Sarah Woerner

Advisor: Dr. Victoria Schindler

Poster Number: 24

Title: Skills for Success: Evaluating the Effectiveness of a MSOT Mentoring Program

This research poster displays demographics and the effectiveness of the Skills for Success program at Stockton University during the 2016-2017 academic year. A pre-and post-test design was used to evaluate the effectiveness of the Skills for Success program during the Fall 2016 semester. The COPM evaluated perceived satisfaction and performance of school-related occupations. The peer mentee participants included undergraduate students with various diagnoses. The mentors included graduate students in the Master of Science in Occupational Therapy program. The undergraduate students engaged in a partnership with their mentors to establish problem areas related to academic performance. Quantitative analysis demonstrates statistically significant improvement in school-related performance and satisfaction.

Kristy Boehmer, Alexandra Burns, & Megan Dmuchowski

Distinguished Research Fellowship Recipients

Advisor: Dr. Megan Foti

Poster Number: 25

Title: Dementia and End of Life Care: The Unique Role of Occupational Therapy

Occupational therapy practitioners offer a unique skill set when working with individuals who have dementia, particularly in the later stages of the disease. Training in client-centered and holistic care enables clinicians to carefully assess one's context, valued roles and occupations, and overall health status. In order to further explore this area and assert the unique value of OT in the hospice setting, a partnership with a local hospice agency was established. Members of this collaboration designed a caregiver education program that focuses on understanding end-stage dementia, facilitating engagement in occupation, creating peaceful environments, and improving overall quality of life of clients and their caregivers. In addition to handouts and resources, this program uses a hands-on workshop, which empowers caregivers to take an active role in the educational process. This poster highlights the steps used to initiate this collaboration, the education model used, and suggestions

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**Jenna Mezzacappa, Allison Herrington-Trebach, Kathleen-Megan Sova,
& Caitlyn Wright**

Advisor: Dr. Victoria Schindler

Poster Number: 29

Title: Attitudes Toward Poverty Scale

Researchers sought to determine the relevance of attitudes toward poverty held by a group of 13 students enrolled in Stockton University's Occupational therapy program. Researchers utilized a pre-test post-test mixed methods design to assess attitudes before and after a trip in which students were directly exposed to large-scale poverty. The trip entailed an eight-day mental health fieldwork experience in Bogotá, Colombia during spring break 2017. Specifically, students attended two universities, community clinical sites, an orphanage, and other cultural sites. Data was collected using the Attitudes Toward Poverty Scale.

Dr. Mary Kientz, Jillian Maisch, Jenna Mezzacappa, & Jose Quintino

Distinguished Research Fellowship Recipients

Advisor: Dr. Mary Kientz

Poster Number: 30

Title: Get Healthy & FIT: Outcomes of an Exercise & Nutrition Program for Individuals with IDD

Get FIT at Stockton University, in collaboration with the Family Resource Network and the Arc of Atlantic County, is a 3-year grant-funded exercise and nutrition program designed for individuals with intellectual and developmental disabilities (IDD). An interdisciplinary team of occupational therapy and physical therapy graduate students, in addition to undergraduate nursing and health science students, work collaboratively to offer the program. Individuals of varied abilities from the community come to sessions at Stockton University twice per week for multiple 12-week sessions. This study utilized various assessment tools to compile quantitative pre

Kathleen-Megan Sova**Advisor:** Dr. Kathleen Klein**Poster Number:** 31**Title:** Enhancing Occupational Performance for Adults with Arthritis in an Aquatic Environment

The role of occupational therapy and adults with arthritis in an aquatic setting is explored in this poster. This poster describes the benefits of a group aquatic exercise class on occupational performance for adults diagnosed with arthritis. Surveys were collected from 24 adult participants with arthritis attending a weekly group aquatic exercise class offered in Ocean County, NJ. Results show a positive impact on physical, leisure, and psychosocial activities that can be correlated with aquatic group exercise classes.

Master of Social Work

Ann F. Jungels, Distinguished Research Fellowship Recipient**Advisor:** Dr. Robin Hernandez-Mekonnen**Poster Number:** 32**Title:** Turning Point: Needs Assessment for a Homeless Day Drop-in Center in Atlantic City

Homelessness is an issue of particular concern in Atlantic City, a tourist destination and urban center experiencing economic decline. There is currently no day shelter so homeless individuals often walk throughout the city in search of shelter or other services. Various outreach efforts are made to engage them, including those of a local church, but there is no single central meeting destination.

This needs assessment has a two pronged methodology. First, best practices of homeless shelter policies in various New Jersey state locations (Bergen, Camden and Mercer Counties) were examined. Next, qualitative interviews were conducted with homeless individuals (N=24) to provide the perspective of those who might use a day shelter. Additional qualitative interviews were conducted with members of a local church's homeless outreach team (N=9) to identify sound, culturally – informed social work interventions with the African-American community.

Preliminary findings of this assessment include themes in four overarching domains. Constituents identified concerns over eligibility criteria, service model, (including service array and staffing) and location of the center. Findings have been integrated in developing and proposing the next phase of Atlantic County's intake center, which is currently seeking funding. Information about state day shelter best practices, policies and procedures has been provided to the Atlantic County Homeless Assessment Resource Team (HART), a county-wide consortium of social services, medical and legal partners focused on reducing homelessness.

Felicia Mainiero, *Distinguished Research Fellowship Recipient*

Advisor: Dr. Robin Hernandez-Mekonnen

Poster Number: 33

Title: A Needs Assessment of the Dimensions of Wellness for Patients at Ancora Psychiatric Hospital

Establishing wellness and recovery are the main goals of treatment for patients at psychiatric hospitals. Wellness and recovery models have shown great improvements in the past for state psychiatric hospitals by focusing on the positives in a person's life rather than the behaviors and symptoms of the mental illness. This project analyzed the results from a needs assessment with patients at Ancora Psychiatric Hospital to identify ways in which Ancora can improve its environment for wellness and recovery by integrating patient perspectives. This project gave patients the opportunity to voice their opinions about changes that would help their wellness and recovery on the units and framed using the eight dimensions of wellness. The findings will inform the creation of a wellness initiative that will incorporate the ideas and responses of the patients to improve the overall wellness of the patients and their treatment and recovery.

Professional Science Master's in Environmental Science

Brian Grillo, *Distinguished Research Fellowship Recipient*

Advisor: Dr. David Hewitt

Poster Number: 34

Title: Using Douglas Fir Derived Biochar and Wood Chips to Immobilize Heavy Metals and Nutrients in Urban Soils

There were two primary objectives to this study. The first was to determine how urban land use changes affect heavy metal mobility in urban soils, and to determine if adding carbon based soil amendments (Douglas Fir derived biochar; wood chips; combination biochar and wood chips), to the soils could help to immobilize Zn, Pb, As, and Al. The second was to determine how removal of nitrogen-fixing Black Alders might affect nitrogen levels and if adding carbon based soil amendments could help immobilize soil nutrients- nitrate (NO₃⁻), ammonium (NH₄⁺), and phosphate in urban soils. Five field plots located in a stand of Black Alder trees were established in a portion of Haddington Woods (Philadelphia, PA) that was undergoing clearing and thinning by the Philadelphia Department of Parks and Recreation. Each plot was treated with various concentrations of carbon based soil amendments, and soil cores were sampled during the 16-month study. The results of the study indicate that the treatment plots amended with biochar had a statistically significant decrease in extractable Zn, Al, and Pb levels by 24.69%, 36%, and 62.94% respectively, while soil amended with wood chips had a decrease in extractable Zn, Al, and Pb levels by 21.02%, 36.44% and 50.7%. Biochar and wood chips were also shown to decrease extractable soil P levels by 87.01% and 82.91% respectively; no change in extractable nitrate, ammonium, or as was noted. This study indicates that biochar has potential to immobilize heavy metals in urban landscapes and brown fields.

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