

[SESSION II: 2:00-3:00pm | STEW 302/306](#)

**2. Exploring Preservice Science Teachers' Views of Science as Socially and Culturally Embedded**

*Jeffrey Radloff & David Eichinger, Science Education*

Achieving widespread scientific literacy has been a longstanding goal of US science standards, requiring that students and teachers possess contemporary nature of science (NOS) conceptions. However, NOS conceptions have been repeatedly found to be wide-ranging or naive, resulting in regular efforts by science education researchers to hone, or standardize them. While this has improved some aspects of NOS conceptions, others remain unchanged, specifically within preservice science teacher populations. One unaffected aspect concerns preservice science teachers' views of science as 'socially and culturally embedded' (SCE), or mutually connected with changes in society and culture; paramount to engaging with scientific issues. The current study employed survey methodology and a grounded approach to explore these views in depth. While many participants viewed science as either 'universal' or 'SCE', the majority identified with a more nuanced, complex combination of these views. Findings are discussed as they relate to preservice science teacher education.

KEYWORDS: Nature of science; preservice science teaching; science education

**4. Young Children's Math Anxiety: Concurrent Associations with Math Motivation and Achievement**

*Yaheng Lu & Youli Mantzicopoulos-James, Early Childhood Education, Undergraduate Research Trainee*

Math anxiety's structure and associations with academic outcomes are rarely examined in young children, for a lack of developmentally appropriate scale. We developed the Young Children's Math Anxiety Scale (YCMAS) and validated it by administering YCMAS to a diverse sample of kindergarten children (N = 355). Results of factor analysis supported a two-factor structure of math anxiety: Worry and Physiological Reactions. We considered psychometric data on both subscales and the whole YCMAS. For evidence of validity, we examined associations between YCMAS scores and measures of math motivation and achievement. Our findings suggest that young children experience math anxiety. Children's report of math anxiety feel is associated with low levels of value and interest in math, and poor math achievement. The YCMAS appears to be a useful tool to investigate math anxiety in young children.

KEYWORDS: math anxiety, young children

**6. Preservice Teachers' Conceptualization of Mathematical Tasks**

*Bima Sapkota & Jill Newton, Mathematics Education*

In this study, I seek to investigate how mathematics preservice teachers (M-PSTs) develop their conceptions of mathematical tasks (MTs) if they are provided with the learning opportunities related to the characteristics of such tasks. The study involved twelve M-PSTs enrolled in a teacher education program at a large Midwestern university. The data was collected through a series of activities enacted by the researcher with the M-PSTs. The Task Analysis Guide (TAG) by Stein et al. (2000) and the Criteria for the Performance Tasks (CPT) by Leinwand and Wiggins (1991) contribute to the framework for data analysis. The open thematic analysis of the M-PSTs' individual and group responses will be used to understand how they demonstrated their knowledge and conceptions related to characteristics of MTs. The analysis will describe how the M-PSTs developed their conceptions over the time as they engaged with the activities related to characteristics of MTs.

KEYWORDS: Mathematics preservice teachers (M-PSTs), conceptions, Mathematical tasks

## GSEC 2018 AGSERS POSTER ASSIGNMENTS

### **8. Adaption of Sherin's Symbolic Forms for the Analysis of Graphical Reasoning**

*Jon-Marc Rodriguez & Marcy H. Towns, Department of Chemistry*

Interpreting graphs is a critical skill across science, technology, engineering, and mathematics fields, but being able to describe processes modeled by graphs is not trivial. In this work we discuss our approach toward analyzing graphical reasoning and provide examples of our analysis. At the center of our approach is the adaption of the symbolic forms framework. Symbolic forms characterize ideas students associate with patterns in a mathematical expression. To expand symbolic forms beyond characterizing equations, we use the general term 'registration' to describe structural features attended to by individuals. When ideas are assigned to these registrations (e.g., parts of an equation or regions of a graph), this can be characterized as reasoning using symbolic forms. In addition, in order to focus on the integration of mathematical reasoning (symbolic forms) and discipline-specific content we frame modeling as describing the process or 'story' that could have given rise to a graph.

*KEYWORDS: mathematical reasoning, symbolic forms, rates*

### **10. Undergraduate Students' Goals and Achievement Strategies for Laboratory Work: A Quantitative Study**

*Stephanie Santos-Diaz & Marcy Towns, Department of Chemistry*

Previous work has shown a discrepancy between the goals of faculty and students for laboratory coursework. Although faculty often list critical thinking skills and learning techniques as goals for laboratory coursework, students tend to focus on goals that are primarily affective in nature. Research on student goals in the laboratory has primarily focused on qualitative methods. Hence, we designed a survey, to administer at the national level, with the purpose of investigating students' goals in the laboratory and how students plan on achieving their goals. Anonymous responses were collected from undergraduate students enrolled in chemistry courses at three different institutions. Preliminary results indicate students consider obtaining good grades as a most important goal; categorize laboratory techniques as less important; and, consider coming to lab prepared their strategy to achieve most important goals. These results could inform the discussions on changing the laboratory curriculum to better align faculty and student goals.

*KEYWORDS: Chemistry Laboratory; Survey; Undergraduate Education*

### **12. Mathematics Problem-Solving Instruction for English Language Learners (ELLs) with Learning Difficulties: A Research Synthesis**

*Qingli Lei & Yan Ping Xin, Special Education*

This article organizes research about using different interventions to improve the math word problem-solving skills of English language learners (ELLs) with learning difficulties or learning disabilities (LD). This article analyzes fourteen quantitative and qualitative studies in several categories, including explicit instruction (e.g. scaffolding instruction and schematic representation), computer-assisted instruction (CAI) and culturally relevant or responsive intervention practices. The results provide various interventions that benefit ELLs with LD. I discuss the implications for educators teaching math word problems to ELLs with LD.

*KEYWORDS: Learning Disabilities; ESL; Math Education*

## GSEC 2018 AGSERS POSTER ASSIGNMENTS

### **14. Strategy Learning in Distributed Cognitive Tasks: Do External Representations Promote Passive Problem Solving?**

*Madison Fansher & Sebastien Helie, Department of Psychology*

Problem spaces consist of internal (e.g., memories) and external (e.g., visual aids) representations. As technology and visual representations are increasingly integrated into the classroom experience, external representations of problems are being added as well. This study examined how problem representations affect successful completion of problems and the development of appropriate problem strategies. One hundred thirty-five undergraduate students were divided into four groups and completed two Tower of Hanoi problems of varying difficulty. The problems presented were either high or low in external representation, depending on condition (e.g., solved mentally or using a computer). The results suggest that external representations support successful problem completion but hinder effective strategy acquisition as indicated by the number of moves to completion for participants solving difficult problems using a computer. The results from this study inform how teachers should present materials to students, especially in STEM-related courses where students are often asked to solve problems.

*KEYWORDS: Problem Solving; Technology*

### **16. Exploring Dimensions of Critical and Creative Thinking through the Lens of Sternberg's Theory of Mental Self-government: An Explorative eDelphi-based Approach to the Potential Tension**

*Mehdi Ghahreman & Marcia Gentry, Gifted, Talented, and Creative Studies*

Developing a survey as a measure, the purpose of this exploratory study was to explore dimensions of critical thinking and creative thinking through the lens of Sternberg's theory of mental self-government. Adopting an eDelphi-based approach to the potential tension, we applied criterion sampling. Our participants were 62 experts in the field of gifted education. In terms of Threefold Model of Intellectual Styles, our paired-sample analyses provide evidence that in these experts' view, individuals with creative mindset have more preferences towards tasks that allow for Type I and Type III thinking styles. In contrast, individuals with critical thinking mindset have more preferences towards tasks that allow for Type II thinking styles. Structural equation modeling techniques were used to examine the underlying factor structure of these concepts, resulted in a 2-factor model for critical thinking ( $\chi^2/df=1.203$ , CFI=0.974, TLI=0.950, RMSEA=0.057), and a 3-factor model for creative thinking ( $\chi^2/df=0.424$ , CFI=1.000, TLI=1.080, RMSEA<0.001).

*KEYWORDS: Thinking Styles, Creative Thinking, Critical Thinking, SEM*

### **18. Are Gifted Underachievers Creatively Gifted?**

*Ophelie Allyssa Desmet & Nielsen Pereira, Gifted Education*

The academic underachievement of gifted children is a severe problem. There is a waste of talent and potential when students cannot or will not perform at an academic level that aligns with their potential (i.e., when they underachieve). It is still unclear which groups of gifted students are at risk for underachievement. Therefore, the purpose of this study is to investigate whether creatively gifted students are more at risk for underachievement than other gifted students and students who are not identified as gifted. Using data from 900 seventh grade students in the Netherlands, I aim to answer the question are creatively gifted students more at risk of underachieving?

*KEYWORDS: Gifted; Underachievement; Creativity*

## GSEC 2018 AGSERS POSTER ASSIGNMENTS

### **20. An Octahedron Model of Wisdom: A Systematic Review of the Wisdom Studies in Three Different Disciplines Psychology; Management and Leadership; and Education**

*Sareh Karami & Marcia Gentry, Gifted, Talented, and Creative Studies*

No consensus on a definition of wisdom exists, and multiple perspectives exist concerning this complex quality. Hence, I systematically reviewed 44 articles in the fields of psychology, management and leadership, and education to examine points of consensus in conceptions of wisdom across a broader area. I limited these articles to the most commonly cited peer-reviewed articles published between 2006 and 2016. As it is not easy to compare the citation numbers in different years, I chose the most cited articles from per year. Based on my review, I offer the Octahedron Model of Wisdom and suggest components that characterize wisdom including knowledge; reflectivity and self-regulation; pro-social behaviors and moral maturity; openness and tolerance; critical thinking; intelligence; creativity; and dynamic balance and synthesis. This study is a step toward defining wisdom components upon which strategies to foster wisdom could be built on. In a world that is perceived to need of wisdom, ways in which to enhance wisdom are important. In the future, researchers can should investigate ways of fostering wisdom through enhancing components of wisdom proposed in the Octahedron Model of Wisdom.

**KEYWORDS:** Wisdom, Education, Wisdom Development, Octahedron Model of Wisdom

### **22. A Quality Review of Interventions for Vocal Stereotypy of Individuals with Autism Spectrum Disorder**

*Danni Wang & Rose Mason, Special Education*

Individuals with autism spectrum disorder (ASD) often engage in repetitive and stereotyped vocalizations that persist in the absence of social consequences, also known as vocal stereotypy. Persistent vocal stereotypy greatly interferes with other people and decreases the chance of inclusion of the individuals with this behavior. Previous reviews (Lanovaz, et al. 2012; DiGennaro Reed, et al. 2012) have synthesized the literature on vocal stereotypy interventions, however, there has been no attempt to evaluate the quality of research. The purpose of this review is to summarize and evaluate the quality of vocal stereotypy intervention for individuals with ASD by using What Works Clearinghouse (WWC) Procedures and Standards (2016). There were 61 studies that resulted from an electric search of three databases and a search of ancestry. Quality indicators mentioned in the standards will be used as coding criteria. Summary of research findings and implications for future research will be discussed.

**KEYWORDS:** *vocal stereotypy, autism spectrum disorder (ASD), review, What Works Clearinghouse (WWC) Procedures and Standards*

### **24. Picture books invite readers through "Gaps" and "Progressions"**

*Rong Zhang & Judith Lysaker, Literacy and Language Education*

Visual literacy has been proven to be beneficial to children language literacy learning. Picture book is an important category of visual literacy. Many teachers and parents of young learners prefer to implement the use of picture books for children's literacy acquisition. In picture books, especially wordless picture books, illustrations do not always demonstrate a fluent description as texts do. There are 'information gaps,' which encourage readers to engage their imagination and experiences into reading activity. My current research is about analyzing information gaps and progressions in wordless picture books and how these 'invitations' would arouse children to use imagination, encourage them to take risk to dive into unfamiliar scenario, and build trustiness between the writer and reader. Through analyzing four wordless picture books, I found that there are mainly two types of information gaps and progressions that would providing exploring opportunity for readers to activate their imaginations.

**KEYWORDS:** *picture book, gap, comprehension, imagination*

## **GSEC 2018 AGSERS POSTER ASSIGNMENTS**

### **26. The Power of Wordless Books for the Development of Imagination**

*Mengying Xue & Judith Lysaker, Literacy & Language Education*

In this study, I examine wordless books as a form of hybrid art. Hybrid art allows us to experience the linear progression of temporality and the network-like display of space (Sipe, 1998). The main concern of this research is to examine the effects of how wordless books provide invitations to young readers so that they are able to work with spatial displays and suggested temporalities and transform them into a linear verbal narrative. To do this I analyzed four wordless books, which are Wave, The Red Book, Rainstorm, and Bee and Me. The results of this analysis are spatial and temporal gaps in the text of stories stimulate readers imagination through the termination of "successful continuation." Therefore, gaps have become one of the essential conditions for the communication between readers and text, as well as the realization of space-time synchronization.

*KEYWORDS: Imagination, Wordless books, Spatial and temporal gaps*

### **28. Enrichment Programs: Enhancing Gifted Students' Talent Domains**

*Jesse Veloz & Marcia Gentry, Curriculum & Instruction*

Enrichment programs serve to provide students with challenging content beyond their normal school curricula that assist in stimulating talent development in a wide variety of areas (Merolla & Serpe 2013). The purpose of this literature review is to answer the research question, 'How do enrichment programs assist in developing gifted students' various talent domains?' This question will contribute to the creation, or improvement of, enrichment programs that serve gifted students by allowing them to take courses well above their respective age level. Using a systematic analysis of current literature on the subject, this review will identify the characteristics of effective enrichment programs and highlight the need for future research. Current findings suggest that enrichment programs assist students' development of talent domains by offering them career skills in various STEM and non-STEM fields ahead of their respective age-level education (Kim 2016).

*KEYWORDS: Enrichment programs, gifted students*

### **30. A Review of Literature on Heritage Language and Cultural transmission among African Immigrants in the US.**

*Araba Osei-Tutu & Nadine Dolby, Curriculum Studies*

This poster is a literature review of heritage language and cultural transmission among immigrants in the U.S. with specific focus on African and Ghanaian immigrants. In this review, I identify 4 themes: the survival and assimilation of immigrants into the new community or environment and the resultant identity that emerges: heritage language and cultural transmission: immigrant students' assimilation into elementary/high schools and racism and discrimination as they settle into their new environment: the role of family and/or immigrant associations in the transmission of Language and culture. The research also indicates that in the elementary, middle, and high school levels, teacher/councilor training programs and institutions should provide educators and councilors the tools needed to effectively deal with the challenges of African immigrants in their classrooms and schools.

*KEYWORDS: Heritage Language, Cultural transmission, Multiculturalism, Multilingualism, Acculturation, Assimilation*

## GSEC 2018 AGSERS POSTER ASSIGNMENTS

### 32. Transformative Awareness of Social Justice through Study Abroad Programs

Alankrita Chhikara, Stephanie Lightner, Jake Burdick & JoAnn Phillion, Curriculum Studies

Multicultural education seeks to promote cultural awareness by identifying social injustices and necessitates action on the part of educators to deepen their cultural competency. Participation in study abroad programs allows preservice teachers (PSTs), predominantly white from rural backgrounds, through self-examination to confront their own cultural deficiencies and biases, transforming the quality of teaching and learning in diverse classrooms. The findings from a two-year study conducted to examine the impact of cultural understanding for PSTs participating in five study abroad programs from a social justice perspective will be presented through this poster presentation. The theoretical framework developed by Courtney Cazden (2012), an interpretation of Nancy Fraser's theory of social justice through examination of the three elements: redistribution, recognition, and representation within the framework of injustices in education, is utilized for the researchers' analysis. This research is significant for the development of social justice ethics in PSTs through these cross-cultural experiences.

*KEYWORDS: social justice, study abroad, preservice teachers*

### 34. Korean Parents' Educational Expectations and Students' Motivational Outcomes

Hyeree Cho & Youli Mantzicopoulos-James, Educational Psychology

Education is a key route for moving up the social ladder in South Korean society. Korean parents invest both psychological and material resources in their children's education expecting the children to succeed in their later life. Even though these expectations have crucial implications for students' academic motivation, evidence that addresses the issue is needed. In the proposed study I address this need. I frame my study within expectancy-value theory which holds that socializers' beliefs such as parents' expectations influence students' motivation in addition to students' own expectancies for success and values (importance, interest, utility, and cost). Using a purposive sample of Korean college students attending a large Midwestern university, I conduct individual interviews with students. I document their perceptions of the ways in which their parents' high expectations on education shape their children's competence beliefs and subjective values for college major choices and career aspirations.

*KEYWORDS: student motivation; parent expectation; expectancy-value theory*

### 36. Review of RISE Indiana

Hannah Dulski, Kristen Burger, & Youli Mantzicopoulos-James, Elementary Education, Undergraduate Research Trainees

RISE Indiana is a teacher evaluation system that is used in the state of Indiana to measure teacher effectiveness and thus meet federal accountability policies. The quality of teachers is important because their primary responsibility is to engage students in rigorous academic content so that they learn and achieve. RISE Indiana was developed to accurately represent teacher effectiveness as it is assumed that effective teachers have significant and measurable effects on student achievement. However, evidence on the technical characteristics of the RISE is needed to support claims about its accuracy in identifying effective teachers. In this report, we review the available data on the RISE with a particular emphasis on the teacher observation protocol. Our review raises major concerns about the measure's observer reliability as well as its predictive validity. We identify specific areas of focus for future research intended to strengthen the qualities of this assessment.

*KEYWORDS: RISE Indiana, teacher evaluation, teacher effectiveness*

## GSEC 2018 AGSERS POSTER ASSIGNMENTS

### **38. The Impact of Representative Curriculum on Minority Elementary Students' Self-Efficacy and Interest in Writing**

*Tj Rosa & Youli Mantzicopoulos-James, Elementary Education, Undergraduate Research Trainee*

I focus on the effects of representative curriculum (RC) on elementary students' motivation for writing. Considered in the framework of culturally responsive teaching, RC curricula make writing culturally relevant as teachers use examples that mirror the culture and experiences of all students. Representative writing curricula affirm students' cultural capital and support their school success. In this study I investigate the effect of RC-based writing lessons on students' self-efficacy and interest in writing, both key aspects of motivation. The sample comprises elementary school students in a school with large numbers of racial minorities who were taught a unit comprised of five lessons based on the principles of RC. I document changes in students' interest in writing as well as their beliefs about being competent writers, before and after the lessons. Evidence from this study will highlight the ways in which RC is linked to students' motivation for writing.

**KEYWORDS:** *Representative Curriculum, Culturally Responsive Teaching, Self-Efficacy, Interest, Motivation, Writing*

### **40. Emergent Comprehension Case Study**

*Kathy Martin & Judith Lysaker, Literacy and Language Education*

This case study is of one child who was part of a larger study about emergent comprehension conducted at a Head Start site in a small urban school district in Indiana. Head Start is a program that promotes the school readiness of preschool children from low-income families. Young children make meaning while interacting with books even though they are not yet reading print. This meaning making through images in books happens in many ways as children listen and retell stories read by their teachers, create stories with wordless books, participate in dramatic play, and write their own versions of favorite stories. This poster presents findings of one five-year-old as he makes meaning while interacting with books in his Head Start classroom.

**KEYWORDS:** *emergent comprehension, low-income, preschool, Head Start*

### **42. Analysis of Multilingual Learners' Interactions in an Afterschool Science Program**

*Mavreen Rose S. Tuvilla & Casey E. Wright, Minjung Ryu, Department of Chemistry*

With increasing linguistic and ethnic diversity in K-12 settings, understanding how multilingual learners collaborate and support their own and each other's participation and learning can give insights for designing more equitable science learning environments. We conducted an afterschool science program that engaged Burmese refugee high school youth who are learning science while developing English proficiency. Participants had varying levels of English proficiency and spoke multiple Chin languages (e.g., Hakha, Falam, Zophei) that were not necessarily mutually intelligible. We present findings from four focal dyads during a session of this afterschool program in which youth constructed posters in response to the question "What will happen in 100 years with continued climate change?" Our analysis showed youth strategically used multiple languages and various communicative modes (gesture, gaze, proxemics, images, etc.) to facilitate one another's access to the learning task and sense-making; thereby leading to a more equitable learning environment.

**KEYWORDS:** *afterschool, science education, multimodality*

## GSEC 2018 AGSERS POSTER ASSIGNMENTS

### **44. Exploring the effect of peer feedback on students' self-efficacy and learning motivation**

*Yishi Long & Victoria Lowell, Learning Design & Technology*

Student interactions and the depth of learning that occurs within the discussions affect the success of asynchronous online discussions (Mazzolini & Maddison, 2003). Dunlap (2005) went further, indicating that student discussion affords students the essential method to exchange ideas, share multiple perspectives, and clarify understandings. However, such benefits like gaining new perspectives can only occur if students are willing to contribute to the discussions (Hew, Cheung & Ng, 2010). Although students can contribute at their own pace to reflect on their own posts and other students' comments (Murphy & Coleman, 2004), a study conducted by Hew and Cheung (2004) showed that some students never contributed in the discussions if it was optional to provide feedback to other students' posts. In this study, the authors will explore the effect of peer feedback on students' self-efficacy and motivation, examining whether peer feedback affects students' learning experience and the quality of their coursework.

*KEYWORDS: peer feedback, self-efficacy, student motivation, asynchronous online discussions*



SESSION III: 3:00-4:00pm | STEW 302/306

**1. Academic and psychological needs in the education of Asian American students: shattering the Model Minority myth**

*Haiyan Li & Wayne Wright, Literacy and Language Education*

With a synthesis review of the current studies on Asian American students (Pang, Han, & Pang, 2013; Liu, 2014; Choi & Lim, 2015; Maramba, 2013; Boun & Wright, 2013), this paper tries to challenge the frequently perpetuated "Model Minority" myths. These studies provide us some hidden realities faced by the often-invisible Asian American students, which have been masked by the allegedly "positive" model minority stereotype. While some groups of Asian American students have attained success in education, it is misleading to aggregate all of them into one homogeneous group. Even with a single ethnic group there is much variability as each student is unique. These studies reveal that many Asian American students are struggling not only academically, but also socially and emotionally. It is imperative for teachers to recognize the vast diversity and complexities of Asian American students. Only by acknowledging the diversity and challenges confronted with Asian students can teachers effectively address their academic, linguistic, cultural, and emotional needs.

KEYWORDS: Asian American; Model Minority; English Language Learners; transmigrant identity

**3. Addressing Food Insecurity in Indiana Public Elementary Schools**

*Ellisa DeFur & Virginia Bolshakova, Elementary Education, Undergraduate Research Trainee*

This study focuses on public elementary school programs implemented to address the issue of food insecurity, whether direct or facilitated. In this study, food insecurity is as defined by the United States Department of Agriculture. The sample comprises ninety-two schools, each of which was randomly selected from each of the ninety-two counties in Indiana. After coding the survey responses, analyses will be conducted to examine a potential relationship between the programs and rate of food insecurity at the schools. The food insecurity rate will be measured by the percent of students who are on the free and reduced lunch plan. This study aims to find themes in the programs offered and will potentially and purposefully be used as reference for schools interested in expanding their programs to address food insecurity.

KEYWORDS: Food Insecurity, Indiana Public Elementary Schools

**5. Parent Interviews: School Equity and School Choice**

*Jessica Puga & Chrity Wessel Powell, Department of Psychology, Undergraduate Research Trainee*

School inequality and an increase in standardized testing has led parents to consider alternative options such as charter schools and voucher schools. The current study focuses on parent's thoughts on having children in an 'F' rated school while living in an 'A' district. We interviewed five parents through surveys and verbal interview techniques. Our results showed that parents believed decreasing standardized testing and increasing curricular freedom would decrease school inequality and decrease the amount of people switching to voucher and charter schools. Further research should continue to investigate actions that may increase equality in schools.

KEYWORDS: education, equality, school choice, inequality, testing

## GSEC 2018 AGSERS POSTER ASSIGNMENTS

### **7. Refracting Gender: Transgender Students in Postsecondary STEM Education**

*Elizabeth Kersey & Rachael Kenney, Mathematics Education*

Gender is one of the categories that organizes the world in which we live. In this narrative study, I look at individuals who transgress the gender binary and their experiences in postsecondary STEM education. I utilize the theoretical perspectives of feminism, queer theory, and intersectionality. I describe the experiences of three participants, one who is a transgender woman and two who are nonbinary. In discussing the findings, I theorize about how the college environment can serve as a prism to reveal gender as a spectrum rather than a binary. I also discuss the role of religion for each of my participants, how their experiences with mathematics compare to their experiences in other STEM fields, and how their experiences have varied with their gender presentation. I also include advice for how to improve the environment in STEM education for people of all genders.

**KEYWORDS:** *transgender, STEM education, narrative inquiry, LGBTQ+*

### **9. A Review of Educational Interventions for Students with ADHD**

*Emma Stricker & Youli Mantzicopoulos-James, Educational Studies, Undergraduate Research Trainee*

Attention Deficit Hyperactivity Disorder (ADHD) - a disability affecting about 5% of school-age children - is characterized by a series of impulsive and hyperactive behaviors that interfere with social, emotional, or academic functioning. The purpose of this review is to identify, describe, and review established educational interventions for these students. This review also seeks to identify gaps within educational interventions. A final six sources (peer reviewed literature published after 2000) were used to identify and examine several types of educational interventions for students with ADHD. Behavioral, academic, and responsiveness to intervention studies were analyzed. Even though there are some interventions that may effectively reduce problem behavior, evidence suggests that there is not one "best" intervention. Future educational research should complete a full systematic review and clearly define terminology. I also provide suggestions of a standard behavioral measure to examine the effectiveness of specific educational interventions.

**KEYWORDS:** *ADHD, review, intervention, behavior*

## **NO 11 NOR 13**

### **15. Structural Analyses of Science Attitudes: Contribution of a correlated-ESEM approach**

*Ji Yoon Jung & Anne Traynor, Educational Psychology*

The examination of attitudes toward science is especially important since it influences students' achievement by reinforcing their performance. Although the Trends in International Mathematics and Science Study (TIMSS) Student Questionnaire has been widely used for measuring students' attitudes toward science, few studies have investigated its factor structure and measurement invariance. This study tested exploratory structural equation (ESEM) and confirmatory factor analysis models using a correlated factors structure to identify the best-fitting model. We found that the correlated factors ESEM (C-ESEM) was the best fitting solution, comprised three factors of enjoyment, self-confidence, and perceived value in learning science. Furthermore, we included testing several invariance models across genders using the C-ESEM. The instrument showed strong measurement invariance across gender groups. This indicated that the instrument measures the same trait for both men and women, so any observed gender differences in students' attitudes toward science scores can be regarded as true differences.

**KEYWORDS:** *attitudes toward science, exploratory structural equation modeling, confirmatory factor analysis, measurement invariance*

## GSEC 2018 AGSERS POSTER ASSIGNMENTS

### **17. Faculty in the Lab: An exploratory study**

*Genisson Silva Coutinho & Alejandra J. Magana, Engineering Education*

Laboratory education plays a fundamental role in the education of engineers. However, recent studies revealed that the potential of laboratory education may not be fully explored by engineering educators. One of the reasons for that is the pervasive use of recipe-based laboratory instruction where students need to follow a set of well-structured steps and write a report. This approach may not help students to develop important engineering skills such as design, creativity and problem-solving. The literature indicates the role of beliefs in faculty decisions regarding instructional approaches. Thus, this study explores the beliefs, values and motivational factors that affect faculty decisions regarding laboratory education. It contributes to a broader discussion about the diffusion of innovations and change in engineering education. The findings will support the development of new initiatives, including professional development programs and policies, which contribute to a change in the laboratory instruction in undergraduate engineering education.

**KEYWORDS:** Faculty beliefs; decision-making; instructional approaches; laboratory

### **19. Research Proposal: Examining how Preservice Elementary Teacher's Views of Science Influence their Science Teacher Identity Constructions**

*Jocelyn Nardo & Minjung Ryu, Department of Chemistry*

Influenced by ideas about the nature of science (NOS), science practices are not heavily emphasized in elementary schools. This may be due to preservice elementary teachers (PSETs) not having clear ideas of NOS. Studies have shown that understanding NOS ideas can develop science teacher identities that are more receptive to learning and teaching science. In this study, I examined ten focus-group interviews with PSETs undertaking a chemistry content. Using Holland and colleagues' (1998) concept of figured worlds, I examined how PSETs' ideas about NOS formed figured worlds of elementary science teaching, elucidating their science teacher identities. Under a discourse analytic approach (Gee, 2013), the languages PSETs used to describe their ideas about NOS and elementary science teaching can reify their science teacher identities. For future students to adopt better science practices, content-courses should foster NOS ideas that help PSETs recognize science as the scientific practices used to investigate natural phenomena.

**KEYWORDS:** *Nature of Science, Teacher Education, Identity*

### **21. Understanding the Figured Worlds of Chemistry Graduate Teaching Assistants**

*Meng Yang Matthew Wu & Minjung Ryu, Department of Chemistry*

Due to the significance of GTAs' presence within instructional chemistry laboratories, many researchers have positioned GTAs as teachers and explored the tensions in their students' learning. However, what these studies infrequently address are the interactions among the multifaceted nature of GTA identities. This proposal offers alternative insights on the multiple identities that GTAs may bring to and co-construct within instructional laboratories and how these moments orchestrate GTAs' overall teaching identity-in-practice. This research project was broken into two phases: the first consisted of interviewing general chemistry laboratory GTAs. The second phase consisted of video recording GTAs and conducting interviews using video-stimulated recall. By using Holland et al.'s figured worlds as our theoretical framework, we coded for local nuances in GTAs' identities and how they agentively negotiate and author their teaching practices. We draw greater implications for recognizing GTAs' constellations of identities to better support their contributions to the learning space.

**KEYWORDS:** *Graduate Teaching Assistants; Identity; Figured Worlds; Chemistry Instructional Laboratory*

## **GSEC 2018 AGSERS POSTER ASSIGNMENTS**

### **23. GeoConnections**

*Darryl Reano & Jonathan Harbor, Department of Earth, Atmospheric, and Planetary Sciences*

GeoConnections is a research project focused on creating geoscience education modules that are place-based and culturally relevant for undergraduate students. The development and implementation of these modules has been and will continue to be guided by a unique Indigenous research framework (IRF) set forth through the use of Sociotransformative Constructivism and Tribal Critical Race Theory. The curriculum for these modules was constructed using a backward design approach in which focused questions are used to align the activities and assessments of the module in a way that develops understanding of key geologic concepts while also offering opportunities for students to demonstrate their understanding in multimodal learning environments. Preliminary analysis of the results showed no statistical significance but also highlight the critical incidents that helped develop stronger connections between Indigenous and non-Indigenous cultures as well as Western science.

*KEYWORDS: Geology, Tribal Critical Race Theory, Indigenous Research Frameworks, Culture, Native American*

### **25. Mathematics Identities Amongst Rural College Applicants**

*Lane Bloome & Rachael Kenney, Mathematics Education*

School mathematics is a critical gatekeeper across K-12 education, colleges, and universities. Indeed, a large body of research has argued that mathematics is a filtering mechanism not only in educational institutions, but also for participation in modern society. This is especially true in rural areas, where matriculation at and graduation from post-secondary institutions is consistently below the national average. However, very little work has investigated mathematics learning environments in rural high schools, and even less work attends to the mathematics identities that students develop in these environments. I propose to study the mathematics identities of rural high school seniors, with particular focus on how their mathematics identities shape their college application process. In order to understand these issues, I propose to conduct this study as a narrative inquiry, using survey data, interviews, and classroom observation to understand these students' experiences as mathematics students, rural people, and college applicants.

*KEYWORDS: mathematics, identity, rural, narrative*

### **27. Exploring students' experiences of belongingness in middle school science classrooms: The development of a coding framework**

*Temitope F. Adeoye, Toni K. Rogat, & Karlyn Adams-Wiggins, Educational Psychology*

Calls to increase school-aged students' pursuit of STEM careers have led researchers to re-evaluate factors impacting STEM persistence and learning. One challenge to obtaining these outcomes is K-12 students' low-quality interest in STEM (Archer, et al., 2013). Classroom belongingness, conceptualized as feeling included and valued by the students and teachers in one's classroom, may be a key to STEM aspirations given positive relationships with higher levels of interest, sustained effort and attention and expectancies for success (Goodenow, 1993; Wentzel, 1998). Developed classroom norms for experiencing oneself as a competent contributor to science, alongside these motivational benefits, may also promote students' identification with STEM over time (Nasir & Vakil, 2017). This presentation aims to synthesize operationalizations of classroom belongingness employed in previous survey and interview measures. This review will inform the development of a coding framework for use in evaluating the relation between students' sense of belongingness in science class with their science aspirations.

*KEYWORDS: belongingness, science, middle school, motivation*

## GSEC 2018 AGSERS POSTER ASSIGNMENTS

### **29. Assessing English Language Learners: Necessity to move away from a single annual standardized test result to reflect individual growth of heterogeneous ELLs**

*Wan Hee Kim & Wayne E. Wright, Literacy and Language Education*

The reliance on standardized test results discounts diverse student population in U.S. schools. For several decades, the annual standardized tests have been used as high-stakes assessments to make decisions based on the overall results rather than on students' individual growth. The myth that high-stakes assessment results present an accurate portrait of English Language Learners' (ELLs) learning progress validates educational policy makers to make these choices. Hence, the federal laws have uniformly endorsed standardized test scores as legitimate representations of ELLs' school performance. Therefore, this poster exhibits a need to measure more nuanced representation of ELLs' academic growth over time by analyzing previous findings in regards to the issues of assessing ELLs in the following aspects: 1) neglecting diversity amongst ELLs, 2) valorizing standardized test results of ELLs, and 3) perpetuating exclusion of ELLs with standard seeking practices

*KEYWORDS: Assessment, English Language Learners, Standardized test*

### **31. How Many Lessons Are Needed To Accurately Evaluate a Teacher's Instructional Practices?**

*Alexis Miller & Youli Mantzicopoulos-James, Elementary Education, Undergraduate Research Trainee*

Teachers are exposed to many different academic stressors, such as state mandated teacher evaluations, a major component of a teacher's overall evaluation. The Indiana Department of Education requires one short lesson of about 20 minutes and one longer lesson of about 40 minutes for an evaluation. It is assumed that the length of these observations are efficient in drawing definitive conclusions about a teacher's effectiveness. However, research suggests that this might not accurately reflect the quality of a teacher. Evidence shows more observations are necessary to reliably measure effective teaching. Fewer observations may be sufficient for other aspects of teaching practices, like behavior management, but it is questionable whether or not the allotted evaluation time is truly sufficient for a comprehensive evaluation. The purpose of this review is to highlight issues in the documentation of instructional observations, with an emphasis on the duration of lessons.

*KEYWORDS: Evaluations, effective teaching*

### **33. Standards-based Grading in Engineering Education: Strengths and Weaknesses**

*Samantha Miller & Youli Mantzicopoulos-James, Educational Studies, Undergraduate Research Trainee*

Standards-based grading (SBG) is used to measure students' knowledge, understanding, and ability to meet specific course objectives. Many educators have adopted this approach to assessing students across K-12 and undergraduate education settings, as its focus on mastery of topics improves learning by identifying specific areas of strengths and weaknesses. Overall, educators find that SBG: (a) provides a more thorough view of students' understanding; and (b) contributes to growth in students' subject-matter knowledge and motivation. However, several challenges have been identified including achieving grading consistency and gaining parental and student support. I review the current literature to address the strengths, short-comings, and areas of improvement for SBG systems with a particular focus on Engineering Education (ENE). I describe elements that are essential to the use of SBG in ENE contexts and identify questions that need to be addressed prior to developing and implementing SBG.

*KEYWORDS: Standards-based grading, engineering, assessment*

## GSEC 2018 AGSERS POSTER ASSIGNMENTS

### **35. What About Humanities? - Parents' Perception of An Overemphasizing Trend of STEM**

*Hyeseong Lee & Marcia Gentry, Gifted Education*

No one can deny the importance of the field of science, technology, engineering, and mathematics (STEM), however, other there are still many students who requires a support developing their talents in other domain areas. These domains include arts, music, languages, and humanities (Subotnik, Olszewski-Kubilius, & Worrell, 2011). To provide equal opportunity to every student, it is necessary to broaden research and look in new directions. In this study, we examined course registration rates of one university-based enrichment program from 2013 through 2017. We also analyzed the responses from parents about which courses they want offered in the future. In addition, extra parent survey (N=156) as well as semi-structured interviews with the parents (N=15) were conducted to see their opinion of disproportion of subject areas in the enrichment program and the general perception regarding STEM-focused environment.

**KEYWORDS:** *Humanities, Non-STEM, Disproportion, Talent Domains*

### **37. How did Adult Learners Use Self-Directed Learning Strategies in a Science of Happiness MOOC Designed for Attitudinal Learning: A qualitative study**

*Shamila Janakiraman & Sunnie Lee Watson, Learning Design & Technology*

Massive Open Online Courses (MOOCs) are offered on diverse topics to reach global audiences, but the dropout rates are high because the activities are not often aligned with the needs of adult learners. Adult learners engage with MOOC content using self-directed learning (SDL) strategies because they are motivated to learn, do not want to miss anything (self-management) and want to self-monitor. To understand their needs, this qualitative study examined their use of SDL strategies to engage with learning activities in a Science of happiness (SOH) MOOC and how that influenced their attitudinal learning. The instructional design of the MOOC facilitated the use of SDL strategies for attitudinal learning. Also, some activities were perceived as not helpful by self-directed learners.

**KEYWORDS:** *Self-directed learners, MOOCs, Attitude change, SDL strategies, MOOC activities*

### **39. Developing Intercultural Leadership Competencies with Virtual Reality**

*Louis Hickman & Mesut Akdere, Department of Technology Leadership & Innovation*

As work has become increasingly global, complex, and collaborative, the need for social skills that complement technical skills has increased. In fact, over the last several decades, wage and employment increases have been in jobs that require high levels of social skills. We are currently conducting a research study that examines the effectiveness of virtual reality (VR) for social skills development, focusing primarily on intercultural leadership competencies. Our novel VR module immerses learners in an international business case, giving them experience interacting with culturally diverse others in a formal setting. Our initial investigation uses experimental design to examine VR's impact on developing intercultural competency, leadership skills, and motivation for future intercultural engagements as compared with traditional video education modules. We expect that VR condition will outperform other forms of social skills education because it is more engaging for students and provides replicable experiences within a safe learning environment.

**KEYWORDS:** *Virtual reality, intercultural competency, leadership, social skills*

## GSEC 2018 AGSERS POSTER ASSIGNMENTS

### **41. Exploring Value Discovery in UX Design Education**

*Sai Shruthi Chivukula & Colin M. Gray, Department of Computer Graphics Technology*

Formalized frameworks that reference ethics and values within human-computer interaction (HCI) and design education have received increasing attention. These methods emphasize the importance of values in relation to design, but provide little guidance to reveal the values that are present or have impact on designers' decision making. Student designers were observed in a protocol study solving an authentic design task. In this study, we propose a method to uncover ethical and value related instances in design activity. Using this method, we were able to identify the values considered by UX designers and the possible intentions that underlie their decisions. We observed that student UX designers had sensitivity towards values, but often contradicted these values through dark, yet tacit, intentions to persuade users, thereby achieving stakeholder goals. We identify implications for future research, underscoring the need to understand the role of ethics and values in practice and design education.

**KEYWORDS:** ethics and values; darkpatterns; decision-making; design education

### **43. She is a computer scientist**

*Ali Alshammari & William Watson, Learning Design & Technology*

Sexism affects different sectors of public life, including the academic sector, where the belief that women are not as good as men is often discipline-specific. This study aims to test the effectiveness of using game design studio as a potential solution to the issue of the underrepresentation of women in computer science. Although still in its infancy, the purpose of this study is to present empirical findings that will provide a foundation for future studies related to the use of and studio pedagogy in the field of CS education. The overarching goal is to determine if women's participation in and perceptions (i.e., their sense of empowerment, usefulness, success, interest, and caring) of a game design studio will result in significant differences in women's learning of computer science.

**KEYWORDS:** *Game-based Learning, Constructionist Gaming, Studio Pedagogy, Leaky Pipeline*

## NUMERICAL ORDER LISTING

### **1. Academic and psychological needs in the education of Asian American students: shattering the Model Minority myth**

*Haiyan Li & Wayne Wright, Literacy and Language Education*

With a synthesis review of the current studies on Asian American students (Pang, Han, & Pang, 2013; Liu, 2014; Choi & Lim, 2015; Maramba, 2013; Boun & Wright, 2013), this paper tries to challenge the frequently perpetuated "Model Minority" myths. These studies provide us some hidden realities faced by the often-invisible Asian American students, which have been masked by the allegedly "positive" model minority stereotype. While some groups of Asian American students have attained success in education, it is misleading to aggregate all of them into one homogeneous group. Even with a single ethnic group there is much variability as each student is unique. These studies reveal that many Asian American students are struggling not only academically, but also socially and emotionally. It is imperative for teachers to recognize the vast diversity and complexities of Asian American students. Only by acknowledging the diversity and challenges confronted with Asian students can teachers effectively address their academic, linguistic, cultural, and emotional needs.

KEYWORDS: Asian American; Model Minority; English Language Learners; transmigrant identity

### **2. Exploring Preservice Science Teachers' Views of Science as Socially and Culturally Embedded**

*Jeffrey Radloff & David Eichinger, Science Education*

Achieving widespread scientific literacy has been a longstanding goal of US science standards, requiring that students and teachers possess contemporary nature of science (NOS) conceptions. However, NOS conceptions have been repeatedly found to be wide-ranging or naive, resulting in regular efforts by science education researchers to hone, or standardize them. While this has improved some aspects of NOS conceptions, others remain unchanged, specifically within preservice science teacher populations. One unaffected aspect concerns preservice science teachers' views of science as 'socially and culturally embedded' (SCE), or mutually connected with changes in society and culture; paramount to engaging with scientific issues. The current study employed survey methodology and a grounded approach to explore these views in depth. While many participants viewed science as either 'universal' or 'SCE', the majority identified with a more nuanced, complex combination of these views. Findings are discussed as they relate to preservice science teacher education.

KEYWORDS: Nature of science; preservice science teaching; science education

### **3. Addressing Food Insecurity in Indiana Public Elementary Schools**

*Ellisa DeFur & Virginia Bolshakova, Elementary Education, Undergraduate Research Trainee*

This study focuses on public elementary school programs implemented to address the issue of food insecurity, whether direct or facilitated. In this study, food insecurity is as defined by the United States Department of Agriculture. The sample comprises ninety-two schools, each of which was randomly selected from each of the ninety-two counties in Indiana. After coding the survey responses, analyses will be conducted to examine a potential relationship between the programs and rate of food insecurity at the schools. The food insecurity rate will be measured by the percent of students who are on the free and reduced lunch plan. This study aims to find themes in the programs offered and will potentially and purposefully be used as reference for schools interested in expanding their programs to address food insecurity.

KEYWORDS: Food Insecurity, Indiana Public Elementary Schools



## GSEC 2018 AGSERS POSTER ASSIGNMENTS

### **4. Young Children's Math Anxiety: Concurrent Associations with Math Motivation and Achievement**

*Yaheng Lu & Youli Mantzicopoulos-James, Early Childhood Education, Undergraduate Research Trainee*

Math anxiety's structure and associations with academic outcomes are rarely examined in young children, for a lack of developmentally appropriate scale. We developed the Young Children's Math Anxiety Scale (YCMAS) and validated it by administering YCMAS to a diverse sample of kindergarten children (N = 355). Results of factor analysis supported a two-factor structure of math anxiety: Worry and Physiological Reactions. We considered psychometric data on both subscales and the whole YCMAS. For evidence of validity, we examined associations between YCMAS scores and measures of math motivation and achievement. Our findings suggest that young children experience math anxiety. Children's report of math anxiety feel is associated with low levels of value and interest in math, and poor math achievement. The YCMAS appears to be a useful tool to investigate math anxiety in young children.

**KEYWORDS:** math anxiety, young children

### **5. Parent Interviews: School Equity and School Choice**

*Jessica Puga & Chrity Wessel Powell, Department of Psychology, Undergraduate Research Trainee*

School inequality and an increase in standardized testing has led parents to consider alternative options such as charter schools and voucher schools. The current study focuses on parent's thoughts on having children in an 'F' rated school while living in an 'A' district. We interviewed five parents through surveys and verbal interview techniques. Our results showed that parents believed decreasing standardized testing and increasing curricular freedom would decrease school inequality and decrease the amount of people switching to voucher and charter schools. Further research should continue to investigate actions that may increase equality in schools.

**KEYWORDS:** education, equality, school choice, inequality, testing

### **6. Preservice Teachers' Conceptualization of Mathematical Tasks**

*Bima Sapkota & Jill Newton, Mathematics Education*

In this study, I seek to investigate how mathematics preservice teachers (M-PSTs) develop their conceptions of mathematical tasks (MTs) if they are provided with the learning opportunities related to the characteristics of such tasks. The study involved twelve M-PSTs enrolled in a teacher education program at a large Midwestern university. The data was collected through a series of activities enacted by the researcher with the M-PSTs. The Task Analysis Guide (TAG) by Stein et al. (2000) and the Criteria for the Performance Tasks (CPT) by Leinwand and Wiggins (1991) contribute to the framework for data analysis. The open thematic analysis of the M-PSTs' individual and group responses will be used to understand how they demonstrated their knowledge and conceptions related to characteristics of MTs. The analysis will describe how the M-PSTs developed their conceptions over the time as they engaged with the activities related to characteristics of MTs.

**KEYWORDS:** Mathematics preservice teachers (M-PSTs), conceptions, Mathematical tasks

## GSEC 2018 AGSERS POSTER ASSIGNMENTS

### **7. Refracting Gender: Transgender Students in Postsecondary STEM Education**

*Elizabeth Kersey & Rachael Kenney, Mathematics Education*

Gender is one of the categories that organizes the world in which we live. In this narrative study, I look at individuals who transgress the gender binary and their experiences in postsecondary STEM education. I utilize the theoretical perspectives of feminism, queer theory, and intersectionality. I describe the experiences of three participants, one who is a transgender woman and two who are nonbinary. In discussing the findings, I theorize about how the college environment can serve as a prism to reveal gender as a spectrum rather than a binary. I also discuss the role of religion for each of my participants, how their experiences with mathematics compare to their experiences in other STEM fields, and how their experiences have varied with their gender presentation. I also include advice for how to improve the environment in STEM education for people of all genders.

*KEYWORDS: transgender, STEM education, narrative inquiry, LGBTQ+*

### **8. Adaption of Sherin's Symbolic Forms for the Analysis of Graphical Reasoning**

*Jon-Marc Rodriguez & Marcy H. Towns, Department of Chemistry*

Interpreting graphs is a critical skill across science, technology, engineering, and mathematics fields, but being able to describe processes modeled by graphs is not trivial. In this work we discuss our approach toward analyzing graphical reasoning and provide examples of our analysis. At the center of our approach is the adaption of the symbolic forms framework. Symbolic forms characterize ideas students associate with patterns in a mathematical expression. To expand symbolic forms beyond characterizing equations, we use the general term 'registration' to describe structural features attended to by individuals. When ideas are assigned to these registrations (e.g., parts of an equation or regions of a graph), this can be characterized as reasoning using symbolic forms. In addition, in order to focus on the integration of mathematical reasoning (symbolic forms) and discipline-specific content we frame modeling as describing the process or 'story' that could have given rise to a graph.

*KEYWORDS: mathematical reasoning, symbolic forms, rates*

### **9. A Review of Educational Interventions for Students with ADHD**

*Emma Stricker & Youli Mantzicopoulos-James, Educational Studies, Undergraduate Research Trainee*

Attention Deficit Hyperactivity Disorder (ADHD) - a disability affecting about 5% of school-age children - is characterized by a series of impulsive and hyperactive behaviors that interfere with social, emotional, or academic functioning. The purpose of this review is to identify, describe, and review established educational interventions for these students. This review also seeks to identify gaps within educational interventions. A final six sources (peer reviewed literature published after 2000) were used to identify and examine several types of educational interventions for students with ADHD. Behavioral, academic, and responsiveness to intervention studies were analyzed. Even though there are some interventions that may effectively reduce problem behavior, evidence suggests that there is not one "best" intervention. Future educational research should complete a full systematic review and clearly define terminology. I also provide suggestions of a standard behavioral measure to examine the effectiveness of specific educational interventions.

*KEYWORDS: ADHD, review, intervention, behavior*

## GSEC 2018 AGSERS POSTER ASSIGNMENTS

### **10. Undergraduate Students' Goals and Achievement Strategies for Laboratory Work: A Quantitative Study**

*Stephanie Santos-Diaz & Marcy Towns, Department of Chemistry*

Previous work has shown a discrepancy between the goals of faculty and students for laboratory coursework. Although faculty often list critical thinking skills and learning techniques as goals for laboratory coursework, students tend to focus on goals that are primarily affective in nature. Research on student goals in the laboratory has primarily focused on qualitative methods. Hence, we designed a survey, to administer at the national level, with the purpose of investigating students' goals in the laboratory and how students plan on achieving their goals. Anonymous responses were collected from undergraduate students enrolled in chemistry courses at three different institutions. Preliminary results indicate students consider obtaining good grades as a most important goal; categorize laboratory techniques as less important; and, consider coming to lab prepared their strategy to achieve most important goals. These results could inform the discussions on changing the laboratory curriculum to better align faculty and student goals.

*KEYWORDS: Chemistry Laboratory; Survey; Undergraduate Education*

### **11. NONE**

### **12. Mathematics Problem-Solving Instruction for English Language Learners (ELLs) with Learning Difficulties: A Research Synthesis**

*Qingli Lei & Yan Ping Xin, Special Education*

This article organizes research about using different interventions to improve the math word problem-solving skills of English language learners (ELLs) with learning difficulties or learning disabilities (LD). This article analyzes fourteen quantitative and qualitative studies in several categories, including explicit instruction (e.g. scaffolding instruction and schematic representation), computer-assisted instruction (CAI) and culturally relevant or responsive intervention practices. The results provide various interventions that benefit ELLs with LD. I discuss the implications for educators teaching math word problems to ELLs with LD.

*KEYWORDS: Learning Disabilities; ESL; Math Education*

### **13. NONE**

### **14. Strategy Learning in Distributed Cognitive Tasks: Do External Representations Promote Passive Problem Solving?**

*Madison Fansher & Sebastien Helie, Department of Psychology*

Problem spaces consist of internal (e.g., memories) and external (e.g., visual aids) representations. As technology and visual representations are increasingly integrated into the classroom experience, external representations of problems are being added as well. This study examined how problem representations affect successful completion of problems and the development of appropriate problem strategies. One hundred thirty-five undergraduate students were divided into four groups and completed two Tower of Hanoi problems of varying difficulty. The problems presented were either high or low in external representation, depending on condition (e.g., solved mentally or using a computer). The results suggest that external representations support successful problem completion but hinder effective strategy acquisition as indicated by the number of moves to completion for participants solving difficult problems using a computer. The results from this study inform how teachers should present materials to students, especially in STEM-related courses where students are often asked to solve problems.

*KEYWORDS: Problem Solving; Technology*

## GSEC 2018 AGSERS POSTER ASSIGNMENTS

### **15. Structural Analyses of Science Attitudes: Contribution of a correlated-ESEM approach**

*Ji Yoon Jung & Anne Traynor, Educational Psychology*

The examination of attitudes toward science is especially important since it influences students' achievement by reinforcing their performance. Although the Trends in International Mathematics and Science Study (TIMSS) Student Questionnaire has been widely used for measuring students' attitudes toward science, few studies have investigated its factor structure and measurement invariance. This study tested exploratory structural equation (ESEM) and confirmatory factor analysis models using a correlated factors structure to identify the best-fitting model. We found that the correlated factors ESEM (C-ESEM) was the best fitting solution, comprised three factors of enjoyment, self-confidence, and perceived value in learning science. Furthermore, we included testing several invariance models across genders using the C-ESEM. The instrument showed strong measurement invariance across gender groups. This indicated that the instrument measures the same trait for both men and women, so any observed gender differences in students' attitudes toward science scores can be regarded as true differences.

**KEYWORDS:** attitudes toward science, exploratory structural equation modeling, confirmatory factor analysis, measurement invariance

### **16. Exploring Dimensions of Critical and Creative Thinking through the Lens of Sternberg's Theory of Mental Self-government: An Explorative eDelphi-based Approach to the Potential Tension**

*Mehdi Ghahreman & Marcia Gentry, Gifted, Talented, and Creative Studies*

Developing a survey as a measure, the purpose of this exploratory study was to explore dimensions of critical thinking and creative thinking through the lens of Sternberg's theory of mental self-government. Adopting an eDelphi-based approach to the potential tension, we applied criterion sampling. Our participants were 62 experts in the field of gifted education. In terms of Threefold Model of Intellectual Styles, our paired-sample analyses provide evidence that in these experts' view, individuals with creative mindset have more preferences towards tasks that allow for Type I and Type III thinking styles. In contrast, individuals with critical thinking mindset have more preferences towards tasks that allow for Type II thinking styles. Structural equation modeling techniques were used to examine the underlying factor structure of these concepts, resulted in a 2-factor model for critical thinking ( $\chi^2$  /df=1.203, CFI=0.974, TLI=0.950, RMSEA=0.057), and a 3-factor model for creative thinking ( $\chi^2$  /df=0.424, CFI=1.000, TLI=1.080, RMSEA<0.001).

**KEYWORDS:** Thinking Styles, Creative Thinking, Critical Thinking, SEM

### **17. Faculty in the Lab: An exploratory study**

*Genisson Silva Coutinho & Alejandra J. Magana, Engineering Education*

Laboratory education plays a fundamental role in the education of engineers. However, recent studies revealed that the potential of laboratory education may not be fully explored by engineering educators. One of the reasons for that is the pervasive use of recipe-based laboratory instruction where students need to follow a set of well-structured steps and write a report. This approach may not help students to develop important engineering skills such as design, creativity and problem-solving. The literature indicates the role of beliefs in faculty decisions regarding instructional approaches. Thus, this study explores the beliefs, values and motivational factors that affect faculty decisions regarding laboratory education. It contributes to a broader discussion about the diffusion of innovations and change in engineering education. The findings will support the development of new initiatives, including professional development programs and policies, which contribute to a change in the laboratory instruction in undergraduate engineering education.

**KEYWORDS:** Faculty beliefs; decision-making; instructional approaches; laboratory

## GSEC 2018 AGSERS POSTER ASSIGNMENTS

### **18. Are Gifted Underachievers Creatively Gifted?**

*Ophelie Allyssa Desmet & Nielsen Pereira, Gifted Education*

The academic underachievement of gifted children is a severe problem. There is a waste of talent and potential when students cannot or will not perform at an academic level that aligns with their potential (i.e., when they underachieve). It is still unclear which groups of gifted students are at risk for underachievement. Therefore, the purpose of this study is to investigate whether creatively gifted students are more at risk for underachievement than other gifted students and students who are not identified as gifted. Using data from 900 seventh grade students in the Netherlands, I aim to answer the question are creatively gifted students more at risk of underachieving?

**KEYWORDS:** Gifted; Underachievement; Creativity

### **19. Research Proposal: Examining how Preservice Elementary Teacher's Views of Science Influence their Science Teacher Identity Constructions**

*Jocelyn Nardo & Minjung Ryu, Department of Chemistry*

Influenced by ideas about the nature of science (NOS), science practices are not heavily emphasized in elementary schools. This may be due to preservice elementary teachers (PSETs) not having clear ideas of NOS. Studies have shown that understanding NOS ideas can develop science teacher identities that are more receptive to learning and teaching science. In this study, I examined ten focus-group interviews with PSETs undertaking a chemistry content. Using Holland and colleagues' (1998) concept of figured worlds, I examined how PSETs' ideas about NOS formed figured worlds of elementary science teaching, elucidating their science teacher identities. Under a discourse analytic approach (Gee, 2013), the languages PSETs used to describe their ideas about NOS and elementary science teaching can reify their science teacher identities. For future students to adopt better science practices, content-courses should foster NOS ideas that help PSETs recognize science as the scientific practices used to investigate natural phenomena.

**KEYWORDS:** *Nature of Science, Teacher Education, Identity*

### **20. An Octahedron Model of Wisdom: A Systematic Review of the Wisdom Studies in Three Different Disciplines Psychology; Management and Leadership; and Education**

*Sareh Karami & Marcia Gentry, Gifted, Talented, and Creative Studies*

No consensus on a definition of wisdom exists, and multiple perspectives exist concerning this complex quality. Hence, I systematically reviewed 44 articles in the fields of psychology, management and leadership, and education to examine points of consensus in conceptions of wisdom across a broader area. I limited these articles to the most commonly cited peer-reviewed articles published between 2006 and 2016. As it is not easy to compare the citation numbers in different years, I chose the most cited articles from per year. Based on my review, I offer the Octahedron Model of Wisdom and suggest components that characterize wisdom including knowledge; reflectivity and self-regulation; pro-social behaviors and moral maturity; openness and tolerance; critical thinking; intelligence; creativity; and dynamic balance and synthesis. This study is a step toward defining wisdom components upon which strategies to foster wisdom could be built on. In a world that is in perceived to need of wisdom, ways in which to enhance wisdom are important. In the future, researchers can should investigate ways of fostering wisdom through enhancing components of wisdom proposed in the Octahedron Model of Wisdom.

**KEYWORDS:** Wisdom, Education, Wisdom Development, Octahedron Model of Wisdom

## GSEC 2018 AGSERS POSTER ASSIGNMENTS

### **21. Understanding the Figured Worlds of Chemistry Graduate Teaching Assistants**

*Meng Yang Matthew Wu & Minjung Ryu, Department of Chemistry*

Due to the significance of GTAs' presence within instructional chemistry laboratories, many researchers have positioned GTAs as teachers and explored the tensions in their students' learning. However, what these studies infrequently address are the interactions among the multifaceted nature of GTA identities. This proposal offers alternative insights on the multiple identities that GTAs may bring to and co-construct within instructional laboratories and how these moments orchestrate GTAs' overall teaching identity-in-practice. This research project was broken into two phases: the first consisted of interviewing general chemistry laboratory GTAs. The second phase consisted of video recording GTAs and conducting interviews using video-stimulated recall. By using Holland et al.'s figured worlds as our theoretical framework, we coded for local nuances in GTAs' identities and how they agentively negotiate and author their teaching practices. We draw greater implications for recognizing GTAs' constellations of identities to better support their contributions to the learning space.

*KEYWORDS: Graduate Teaching Assistants; Identity; Figured Worlds; Chemistry Instructional Laboratory*

### **22. A Quality Review of Interventions for Vocal Stereotypy of Individuals with Autism Spectrum Disorder**

*Danni Wang & Rose Mason, Special Education*

Individuals with autism spectrum disorder (ASD) often engage in repetitive and stereotyped vocalizations that persist in the absence of social consequences, also known as vocal stereotypy. Persistent vocal stereotypy greatly interferes with other people and decreases the chance of inclusion of the individuals with this behavior. Previous reviews (Lanovaz, et al. 2012; DiGennaro Reed, et al. 2012) have synthesized the literature on vocal stereotypy interventions, however, there has been no attempt to evaluate the quality of research. The purpose of this review is to summarize and evaluate the quality of vocal stereotypy intervention for individuals with ASD by using What Works Clearinghouse (WWC) Procedures and Standards (2016). There were 61 studies that resulted from an electric search of three databases and a search of ancestry. Quality indicators mentioned in the standards will be used as coding criteria. Summary of research findings and implications for future research will be discussed.

*KEYWORDS: vocal stereotypy, autism spectrum disorder (ASD), review, What Works Clearinghouse (WWC) Procedures and Standards*

### **23. GeoConnections**

*Darryl Reano & Jonathan Harbor, Department of Earth, Atmospheric, and Planetary Sciences*

GeoConnections is a research project focused on creating geoscience education modules that are place-based and culturally relevant for undergraduate students. The development and implementation of these modules has been and will continue to be guided by a unique Indigenous research framework (IRF) set forth through the use of Sociotransformative Constructivism and Tribal Critical Race Theory. The curriculum for these modules was constructed using a backward design approach in which focused questions are used to align the activities and assessments of the module in a way that develops understanding of key geologic concepts while also offering opportunities for students to demonstrate their understanding in multimodal learning environments. Preliminary analysis of the results showed no statistical significance but also highlight the critical incidents that helped develop stronger connections between Indigenous and non-Indigenous cultures as well as Western science.

*KEYWORDS: Geology, Tribal Critical Race Theory, Indigenous Research Frameworks, Culture, Native American*

## GSEC 2018 AGSERS POSTER ASSIGNMENTS

### **24. Picture books invite readers through "Gaps" and "Progressions"**

*Rong Zhang & Judith Lysaker, Literacy and Language Education*

Visual literacy has been proven to be beneficial to children language literacy learning. Picture book is an important category of visual literacy. Many teachers and parents of young learners prefer to implement the use of picture books for children's literacy acquisition. In picture books, especially wordless picture books, illustrations do not always demonstrate a fluent description as texts do. There are 'information gaps,' which encourage readers to engage their imagination and experiences into reading activity. My current research is about analyzing information gaps and progressions in wordless picture books and how these 'invitations' would arouse children to use imagination, encourage them to take risk to dive into unfamiliar scenario, and build trustiness between the writer and reader. Through analyzing four wordless picture books, I found that there are mainly two types of information gaps and progressions that would providing exploring opportunity for readers to activate their imaginations.

*KEYWORDS: picture book, gap, comprehension, imagination*

### **25. Mathematics Identities Amongst Rural College Applicants**

*Lane Bloome & Rachael Kenney, Mathematics Education*

School mathematics is a critical gatekeeper across K-12 education, colleges, and universities. Indeed, a large body of research has argued that mathematics is a filtering mechanism not only in educational institutions, but also for participation in modern society. This is especially true in rural areas, where matriculation at and graduation from post-secondary institutions is consistently below the national average. However, very little work has investigated mathematics learning environments in rural high schools, and even less work attends to the mathematics identities that students develop in these environments. I propose to study the mathematics identities of rural high school seniors, with particular focus on how their mathematics identities shape their college application process. In order to understand these issues, I propose to conduct this study as a narrative inquiry, using survey data, interviews, and classroom observation to understand these students' experiences as mathematics students, rural people, and college applicants.

*KEYWORDS: mathematics, identity, rural, narrative*

### **26. The Power of Wordless Books for the Development of Imagination**

*Mengying Xue & Judith Lysaker, Literacy & Language Education*

In this study, I examine wordless books as a form of hybrid art. Hybrid art allows us to experience the linear progression of temporality and the network-like display of space (Sipe, 1998). The main concern of this research is to examine the effects of how wordless books provide invitations to young readers so that they are able to work with spatial displays and suggested temporalities and transform them into a linear verbal narrative. To do this I analyzed four wordless books, which are Wave, The Red Book, Rainstorm, and Bee and Me. The results of this analysis are spatial and temporal gaps in the text of stories stimulate readers imagination through the termination of "successful continuation." Therefore, gaps have become one of the essential conditions for the communication between readers and text, as well as the realization of space-time synchronization.

*KEYWORDS: Imagination, Wordless books, Spatial and temporal gaps*

## GSEC 2018 AGSERS POSTER ASSIGNMENTS

### **27. Exploring students' experiences of belongingness in middle school science classrooms: The development of a coding framework**

*Temitope F. Adeoye, Toni K. Rogat, & Karlyn Adams-Wiggins, Educational Psychology*

Calls to increase school-aged students' pursuit of STEM careers have led researchers to re-evaluate factors impacting STEM persistence and learning. One challenge to obtaining these outcomes is K-12 students' low-quality interest in STEM (Archer, et al., 2013). Classroom belongingness, conceptualized as feeling included and valued by the students and teachers in one's classroom, may be a key to STEM aspirations given positive relationships with higher levels of interest, sustained effort and attention and expectancies for success (Goodenow, 1993; Wentzel, 1998). Developed classrooms norms for experiencing oneself as a competent contributor to science, alongside these motivational benefits, may also promote students' identification with STEM over time (Nasir & Vakil, 2017). This presentation aims to synthesize operationalizations of classroom belongingness employed in previous survey and interview measures. This review will inform the development of a coding framework for use in evaluating the relation between students' sense of belongingness in science class with their science aspirations.

*KEYWORDS: belongingness, science, middle school, motivation*

### **28. Enrichment Programs: Enhancing Gifted Students' Talent Domains**

*Jesse Veloz & Marcia Gentry, Curriculum & Instruction*

Enrichment programs serve to provide students with challenging content beyond their normal school curricula that assist in stimulating talent development in a wide variety of areas (Merolla & Serpe 2013). The purpose of this literature review is to answer the research question, 'How do enrichment programs assist in developing gifted students' various talent domains?' This question will contribute to the creation, or improvement of, enrichment programs that serve gifted students by allowing them to take courses well above their respective age level. Using a systematic analysis of current literature on the subject, this review will identify the characteristics of effective enrichment programs and highlight the need for future research. Current findings suggest that enrichment programs assist students' development of talent domains by offering them career skills in various STEM and non-STEM fields ahead of their respective age-level education (Kim 2016).

*KEYWORDS: Enrichment programs, gifted students*

### **29. Assessing English Language Learners: Necessity to move away from a single annual standardized test result to reflect individual growth of heterogeneous ELLs**

*Wan Hee Kim & Wayne E. Wright, Literacy and Language Education*

The reliance on standardized test results discounts diverse student population in U.S. schools. For several decades, the annual standardized tests have been used as high-stakes assessments to make decisions based on the overall results rather than on students' individual growth. The myth that high-stakes assessment results present an accurate portrait of English Language Learners' (ELLs) learning progress validates educational policy makers to make these choices. Hence, the federal laws have uniformly endorsed standardized test scores as legitimate representations of ELLs' school performance. Therefore, this poster exhibits a need to measure more nuanced representation of ELLs' academic growth over time by analyzing previous findings in regards to the issues of assessing ELLs in the following aspects: 1) neglecting diversity amongst ELLs, 2) valorizing standardized test results of ELLs, and 3) perpetuating exclusion of ELLs with standard seeking practices

*KEYWORDS: Assessment, English Language Learners, Standardized test*



## GSEC 2018 AGSERS POSTER ASSIGNMENTS

### **30. A Review of Literature on Heritage Language and Cultural transmission among African Immigrants in the US.**

*Araba Osei-Tutu & Nadine Dolby, Curriculum Studies*

This poster is a literature review of heritage language and cultural transmission among immigrants in the U.S. with specific focus on African and Ghanaian immigrants. In this review, I identify 4 themes: the survival and assimilation of immigrants into the new community or environment and the resultant identity that emerges: heritage language and cultural transmission: immigrant students' assimilation into elementary/high schools and racism and discrimination as they settle into their new environment: the role of family and/or immigrant associations in the transmission of Language and culture. The research also indicates that in the elementary, middle, and high school levels, teacher/councilor training programs and institutions should provide educators and councilors the tools needed to effectively deal with the challenges of African immigrants in their classrooms and schools.

**KEYWORDS:** Heritage Language, Cultural transmission, Multiculturalism, Multilingualism, Acculturation, Assimilation

### **31. How Many Lessons Are Needed To Accurately Evaluate a Teacher's Instructional Practices?**

*Alexis Miller & Youli Mantzicopoulos-James, Elementary Education, Undergraduate Research Trainee*

Teachers are exposed to many different academic stressors, such as state mandated teacher evaluations, a major component of a teacher's overall evaluation. The Indiana Department of Education requires one short lesson of about 20 minutes and one longer lesson of about 40 minutes for an evaluation. It is assumed that the length of these observations are efficient in drawing definitive conclusions about a teacher's effectiveness. However, research suggests that this might not accurately reflect the quality of a teacher. Evidence shows more observations are necessary to reliably measure effective teaching. Fewer observations may be sufficient for other aspects of teaching practices, like behavior management, but it is questionable whether or not the allotted evaluation time is truly sufficient for a comprehensive evaluation. The purpose of this review is to highlight issues in the documentation of instructional observations, with an emphasis on the duration of lessons.

**KEYWORDS:** *Evaluations, effective teaching*

### **32. Transformative Awareness of Social Justice through Study Abroad Programs**

*Alankrita Chhikara, Stephanie Lightner, Jake Burdick & JoAnn Phillion, Curriculum Studies*

Multicultural education seeks to promote cultural awareness by identifying social injustices and necessitates action on the part of educators to deepen their cultural competency. Participation in study abroad programs allows preservice teachers (PSTs), predominantly white from rural backgrounds, through self-examination to confront their own cultural deficiencies and biases, transforming the quality of teaching and learning in diverse classrooms. The findings from a two-year study conducted to examine the impact of cultural understanding for PSTs participating in five study abroad programs from a social justice perspective will be presented through this poster presentation. The theoretical framework developed by Courtney Cazden (2012), an interpretation of Nancy Fraser's theory of social justice through examination of the three elements: redistribution, recognition, and representation within the framework of injustices in education, is utilized for the researchers' analysis. This research is significant for the development of social justice ethics in PSTs through these cross-cultural experiences.

**KEYWORDS:** *social justice, study abroad, preservice teachers*

## **GSEC 2018 AGSERS POSTER ASSIGNMENTS**

### **33. Standards-based Grading in Engineering Education: Strengths and Weaknesses**

*Samantha Miller & Youli Mantzicopoulos-James, Educational Studies, Undergraduate Research Trainee*

Standards-based grading (SBG) is used to measure students' knowledge, understanding, and ability to meet specific course objectives. Many educators have adopted this approach to assessing students across K-12 and undergraduate education settings, as its focus on mastery of topics improves learning by identifying specific areas of strengths and weaknesses. Overall, educators find that SBG: (a) provides a more thorough view of students' understanding; and (b) contributes to growth in students' subject-matter knowledge and motivation. However, several challenges have been identified including achieving grading consistency and gaining parental and student support. I review the current literature to address the strengths, short-comings, and areas of improvement for SBG systems with a particular focus on Engineering Education (ENE). I describe elements that are essential to the use of SBG in ENE contexts and identify questions that need to be addressed prior to developing and implementing SBG.

*KEYWORDS: Standards-based grading, engineering, assessment*

### **34. Korean Parents' Educational Expectations and Students' Motivational Outcomes**

*Hyeree Cho & Youli Mantzicopoulos-James, Educational Psychology*

Education is a key route for moving up the social ladder in South Korean society. Korean parents invest both psychological and material resources in their children's education expecting the children to succeed in their later life. Even though these expectations have crucial implications for students' academic motivation, evidence that addresses the issue is needed. In the proposed study I address this need. I frame my study within expectancy-value theory which holds that socializers' beliefs such as parents' expectations influence students' motivation in addition to students' own expectancies for success and values (importance, interest, utility, and cost). Using a purposive sample of Korean college students attending a large Midwestern university, I conduct individual interviews with students. I document their perceptions of the ways in which their parents' high expectations on education shape their children's competence beliefs and subjective values for college major choices and career aspirations.

*KEYWORDS: student motivation; parent expectation; expectancy-value theory*

### **35. What About Humanities? - Parents' Perception of An Overemphasizing Trend of STEM**

*Hyeseong Lee & Marcia Gentry, Gifted Education*

No one can deny the importance of the field of science, technology, engineering, and mathematics (STEM), however, other there are still many students who requires a support developing their talents in other domain areas. These domains include arts, music, languages, and humanities (Subotnik, Olszewski-Kubilius, & Worrell, 2011). To provide equal opportunity to every student, it is necessary to broaden research and look in new directions. In this study, we examined course registration rates of one university-based enrichment program from 2013 through 2017. We also analyzed the responses from parents about which courses they want offered in the future. In addition, extra parent survey (N=156) as well as semi-structured interviews with the parents (N=15) were conducted to see their opinion of disproportion of subject areas in the enrichment program and the general perception regarding STEM-focused environment.

*KEYWORDS: Humanities, Non-STEM, Disproportion, Talent Domains*

## GSEC 2018 AGSERS POSTER ASSIGNMENTS

### **36. Review of RISE Indiana**

*Hannah Dulski, Kristen Burger, & Youli Mantzicopoulos-James, Elementary Education, Undergraduate Research Trainees*

RISE Indiana is a teacher evaluation system that is used in the state of Indiana to measure teacher effectiveness and thus meet federal accountability policies. The quality of teachers is important because their primary responsibility is to engage students in rigorous academic content so that they learn and achieve. RISE Indiana was developed to accurately represent teacher effectiveness as it is assumed that effective teachers have significant and measurable effects on student achievement. However, evidence on the technical characteristics of the RISE is needed to support claims about its accuracy in identifying effective teachers. In this report, we review the available data on the RISE with a particular emphasis on the teacher observation protocol. Our review raises major concerns about the measure's observer reliability as well as its predictive validity. We identify specific areas of focus for future research intended to strengthen the qualities of this assessment.

KEYWORDS: RISE Indiana, teacher evaluation, teacher effectiveness

### **37. How did Adult Learners Use Self-Directed Learning Strategies in a Science of Happiness MOOC Designed for Attitudinal Learning: A qualitative study**

*Shamila Janakiraman & Sunnie Lee Watson, Learning Design & Technology*

Massive Open Online Courses (MOOCs) are offered on diverse topics to reach global audiences, but the dropout rates are high because the activities are not often aligned with the needs of adult learners. Adult learners engage with MOOC content using self-directed learning (SDL) strategies because they are motivated to learn, do not want to miss anything (self-management) and want to self-monitor. To understand their needs, this qualitative study examined their use of SDL strategies to engage with learning activities in a Science of happiness (SOH) MOOC and how that influenced their attitudinal learning. The instructional design of the MOOC facilitated the use of SDL strategies for attitudinal learning. Also, some activities were perceived as not helpful by self-directed learners.

KEYWORDS: Self-directed learners, MOOCs, Attitude change, SDL strategies, MOOC activities

### **38. The Impact of Representative Curriculum on Minority Elementary Students' Self-Efficacy and Interest in Writing**

*Tj Rosa & Youli Mantzicopoulos-James, Elementary Education, Undergraduate Research Trainee*

I focus on the effects of representative curriculum (RC) on elementary students' motivation for writing. Considered in the framework of culturally responsive teaching, RC curricula make writing culturally relevant as teachers use examples that mirror the culture and experiences of all students. Representative writing curricula affirm students' cultural capital and support their school success. In this study I investigate the effect of RC-based writing lessons on students' self-efficacy and interest in writing, both key aspects of motivation. The sample comprises elementary school students in a school with large numbers of racial minorities who were taught a unit comprised of five lessons based on the principles of RC. I document changes in students' interest in writing as well as their beliefs about being competent writers, before and after the lessons. Evidence from this study will highlight the ways in which RC is linked to students' motivation for writing.

KEYWORDS: Representative Curriculum, Culturally Responsive Teaching, Self-Efficacy, Interest, Motivation, Writing

## **GSEC 2018 AGSERS POSTER ASSIGNMENTS**

### **39. Developing Intercultural Leadership Competencies with Virtual Reality**

*Louis Hickman & Mesut Akdere, Department of Technology Leadership & Innovation*

As work has become increasingly global, complex, and collaborative, the need for social skills that complement technical skills has increased. In fact, over the last several decades, wage and employment increases have been in jobs that require high levels of social skills. We are currently conducting a research study that examines the effectiveness of virtual reality (VR) for social skills development, focusing primarily on intercultural leadership competencies. Our novel VR module immerses learners in an international business case, giving them experience interacting with culturally diverse others in a formal setting. Our initial investigation uses experimental design to examine VR's impact on developing intercultural competency, leadership skills, and motivation for future intercultural engagements as compared with traditional video education modules. We expect that VR condition will outperform other forms of social skills education because it is more engaging for students and provides replicable experiences within a safe learning environment.

**KEYWORDS:** Virtual reality, intercultural competency, leadership, social skills

### **40. Emergent Comprehension Case Study**

*Kathy Martin & Judith Lysaker, Literacy and Language Education*

This case study is of one child who was part of a larger study about emergent comprehension conducted at a Head Start site in a small urban school district in Indiana. Head Start is a program that promotes the school readiness of preschool children from low-income families. Young children make meaning while interacting with books even though they are not yet reading print. This meaning making through images in books happens in many ways as children listen and retell stories read by their teachers, create stories with wordless books, participate in dramatic play, and write their own versions of favorite stories. This poster presents findings of one five-year-old as he makes meaning while interacting with books in his Head Start classroom.

**KEYWORDS:** *emergent comprehension, low-income, preschool, Head Start*

### **41. Exploring Value Discovery in UX Design Education**

*Sai Shruthi Chivukula & Colin M. Gray, Department of Computer Graphics Technology*

Formalized frameworks that reference ethics and values within human-computer interaction (HCI) and design education have received increasing attention. These methods emphasize the importance of values in relation to design, but provide little guidance to reveal the values that are present or have impact on designers' decision making. Student designers were observed in a protocol study solving an authentic design task. In this study, we propose a method to uncover ethical and value related instances in design activity. Using this method, we were able to identify the values considered by UX designers and the possible intentions that underlie their decisions. We observed that student UX designers had sensitivity towards values, but often contradicted these values through dark, yet tacit, intentions to persuade users, thereby achieving stakeholder goals. We identify implications for future research, underscoring the need to understand the role of ethics and values in practice and design education.

**KEYWORDS:** ethics and values; darkpatterns; decision-making; design education

## GSEC 2018 AGSERS POSTER ASSIGNMENTS

### **42. Analysis of Multilingual Learners' Interactions in an Afterschool Science Program**

*Mavreen Rose S. Tuvilla & Casey E. Wright, Minjung Ryu, Department of Chemistry*

With increasing linguistic and ethnic diversity in K-12 settings, understanding how multilingual learners collaborate and support their own and each other's participation and learning can give insights for designing more equitable science learning environments. We conducted an afterschool science program that engaged Burmese refugee high school youth who are learning science while developing English proficiency. Participants had varying levels of English proficiency and spoke multiple Chin languages (e.g., Hakha, Falam, Zophei) that were not necessarily mutually intelligible. We present findings from four focal dyads during a session of this afterschool program in which youth constructed posters in response to the question "What will happen in 100 years with continued climate change?" Our analysis showed youth strategically used multiple languages and various communicative modes (gesture, gaze, proxemics, images, etc.) to facilitate one another's access to the learning task and sense-making; thereby leading to a more equitable learning environment.

*KEYWORDS: afterschool, science education, multimodality*

### **43. She is a computer scientist**

*Ali Alshammari & William Watson, Learning Design & Technology*

Sexism affects different sectors of public life, including the academic sector, where the belief that women are not as good as men is often discipline-specific. This study aims to test the effectiveness of using game design studio as a potential solution to the issue of the underrepresentation of women in computer science. Although still in its infancy, the purpose of this study is to present empirical findings that will provide a foundation for future studies related to the use of and studio pedagogy in the field of CS education. The overarching goal is to determine if women's participation in and perceptions (i.e., their sense of empowerment, usefulness, success, interest, and caring) of a game design studio will result in significant differences in women's learning of computer science.

*KEYWORDS: Game-based Learning, Constructionist Gaming, Studio Pedagogy, Leaky Pipeline*

### **44. Exploring the effect of peer feedback on students' self-efficacy and learning motivation**

*Yishi Long & Victoria Lowell, Learning Design & Technology*

Student interactions and the depth of learning that occurs within the discussions affect the success of asynchronous online discussions (Mazzolini & Maddison, 2003). Dunlap (2005) went further, indicating that student discussion affords students the essential method to exchange ideas, share multiple perspectives, and clarify understandings. However, such benefits like gaining new perspectives can only occur if students are willing to contribute to the discussions (Hew, Cheung & Ng, 2010). Although students can contribute at their own pace to reflect on their own posts and other students' comments (Murphy & Coleman, 2004), a study conducted by Hew and Cheung (2004) showed that some students never contributed in the discussions if it was optional to provide feedback to other students' posts. In this study, the authors will explore the effect of peer feedback on students' self-efficacy and motivation, examining whether peer feedback affects students' learning experience and the quality of their coursework.

*KEYWORDS: peer feedback, self-efficacy, student motivation, asynchronous online discussions*