Exposure to Adverse Childhood Events Impairs Attentional Self-Control Brain Systems in Deaf and Hearing Adults

Vincent J. Samar, Ph.D., Associate Professor, Department of Liberal Studies

Socioeconomic disadvantage increases children’s risk of exposure to various adverse events, such as complications of pregnancy, intrauterine illness, malnutrition, head injury, postnatal infections, etc. Exposure to such events impairs children’s physical growth as well as their neurocognitive growth, especially the growth of attentional self-control brain systems. Impaired neurocognitive growth may affect an individual’s performance and behavior in classroom and career later in adult life. Recent EEG studies of deaf and hearing adults (Samar, Segalowitz, & Desjardins, Association for Psychological Science 2013, 2014) show that adults from low childhood socioeconomic status backgrounds (low-CSES) have reduced activity in the attentional self-control network in the frontal lobes compared with adults from high-CSES backgrounds. Correlations between the strength of this EEG activity and body proportion data (leg and trunk length, BMI), collected from low-CSES deaf and hearing participants in these studies, are consistent with the interpretation that this reduced EEG activity may be specifically related to earlier childhood exposure to adverse events. This interpretation is plausible because such adverse childhood events (ACEs) are known to dysregulate both physical and neurocognitive growth pathways through complex epigenetic and metabolic reprogramming during childhood, possibly leading to deficits in attentional and behavioral self control in adulthood similar to those caused by ADHD. However, our previous studies did not rule out the possibility that these body proportion alterations and the reduced EEG activity associated with low C-SES may simply result from learned deficits in self control due to the long-term psychosocial stresses of social disadvantage, rather than from physiologically programmed growth dysregulation triggered by ACEs. In the current study, we separately assessed participant’s childhood SES and their history of the presence of ACEs. We now report new brain wave and body measurement data to support the hypothesis that the reduced activation of the attentional control network associated with low CSES is specifically mediated by the presence of ACEs rather than the influence of socioeconomic class environment per se. Fifty deaf undergraduates reported parents’ education and occupation (SES proxies) and reported positive (ACE+) or negative (ACE-) histories from prenatal life to age 18 (15 ACE+ & 10 ACE- H-CSES participants; 10 ACE+ & 15 ACE- L-CSES participants). We measured leg length, trunk length, and BMI. We recorded 64-channel EEG in a visual behavioral-inhibition task that measured participants’ ability to inhibit pressing a button to certain stimuli. We isolated a brain wave component that measured activity in frontal-lobe self-control circuits. Comparing ACE+ and ACE- groups collapsed over CSES categories, the EEG activation was reduced for the ACE+ compared with the ACE- group (bootstrapped z’s>3.0, p’s<.0015). By contrast, L-CSES and H-CSES groups (collapsed over ACE categories) had statistically equivalent EEG activation levels. These results support our hypothesis that deaf and hearing young adults who experience adverse events prenatally or during childhood may develop physiologically programmed deficits in attentional self control that persist into adulthood. Childhood socioeconomic disadvantage may place deaf and hearing young adults at increased risk for poor performance in school and career due to the developmental consequences of their increased rates of exposure to adverse childhood events. Because adult attentional self-control deficits may be physiologically programmed by the occurrence of ACEs, affected individuals may require specialized evaluation and accommodation during adulthood.

Written with Sidney Segalowitz & James Desjardins
ADHD is associated with major mental health conditions, including anxiety and depression. Validly assessing ADHD in deaf adults, including college students, may provide a useful indicator of potential mental health concerns that could influence classroom performance and career success. This and earlier studies focused on demonstrating that the Attention Deficit Scales for Adults: Sign Language Version (ADSA-SLV; Parasnis, Berent, Samar, Triolo, & Murphy, 2008, Rochester, NY: RIT) is a reliable and valid tool for assessing ADHD in deaf adults and that it is predictive of the presence of anxiety and depression in that population. The ADSA-SLV is a linguistically accessible ADHD self-rating test for deaf and hard-of-hearing adults. It offers ASL and English-based sign language with or without voice, and English print, meeting the heterogeneous language needs of the deaf community. It has 9 scales: Attention Focus/Concentration, Interpersonal, Behavior/Disorganized Activity, Coordination, Academic Theme, Emotive, Consistency/Long Term, Childhood, and Negative Social. Parasnis and Samar (Association for Psychological Science Convention, 2013 May) reported high internal consistency reliability (.>92) and little differential item functioning bias for the ADSA-SLV. Parasnis and Samar (Association for Psychological Science Convention, 2014 May) tested 59 non-ADHD (Deaf n=32; Hearing n=27) and 28 self-reported ADHD (Deaf n=19; Hearing n=9) undergraduates to estimate ADSA-SLV criterion validity against the Behavior Rating Inventory of Executive Function (BRIEF-A), a valid executive function test for deaf and hearing undergraduates (Hauser, Lukomski, & Samar, 2013, J. Psychoed. Assess., 31, 363-374). Deaf and hearing participants were statistically equivalent on each ADSA-SLV scale, and, as expected, both deaf and hearing ADHD participants scored significantly higher on the ADSA-SLV than non-ADHD participants. Parasnis and Samar (2014, May) reported excellent criterion validity (Deaf r=.89; Hearing r=.92), with good sensitivity and specificity for ADHD classification (Deaf: sensitivity=.68, specificity=.68; Hearing: sensitivity=.78, specificity=.78), but sample sizes were relatively low. Therefore, in the present study, we gave the ADSA-SLV and BRIEF-A to 66 additional undergraduates (54 Deaf, 12 Hearing), increasing the total sample size by 75% to n=153 to more accurately estimate ADSA-SLV criterion validity. Results confirm excellent criterion validity (Deaf r=.90, Hearing r=.95; both corrected for attenuation due to imperfect reliability) and good sensitivity and specificity (Deaf sensitivity=.63, specificity=.62; Hearing sensitivity=.78; specificity=.67). In addition, we report new predictive validity results for the ADSA-SLV using the Beck Anxiety and Depression Inventories presented in sign language or English print as predicted measures. Results reveal good-to-excellent prediction of anxiety and depression (Beck Anxiety Inventory: Deaf r=.46, Hearing r=.65; Beck Depression Inventory: Deaf r=.77, Hearing r=.93; all corrected for attenuation). These results support and extend our earlier ADSA-SLV validation results and strengthen the rationale for using the ADSA-SLV in comprehensive ADHD and mental health screening and diagnosis protocols for deaf adults. Evidence of ADHD in individual deaf college students in particular may be a marker for clinically significant anxiety and depression that could affect classroom performance and behavior, and career success in later life.

Assistants:
Amanda Lease & Marissa Polvere

NTID Scholarship Symposium
May 28, 2015

Student Development Center
Rochester Institute of Technology

The NTID Scholarship Symposium is a day-long event showcasing scholarly work done by NTID faculty and staff. Most of the work falls into one of the four categories of research noted by Strategic Decisions 2020:
1. Teaching and Learning
2. Language and Literacy/Communication
3. Communication Technology / Access and Support Services
4. Employment, Adaptability to Social Change, and the Global Workplace

Creative and other work that may not fit these categories also has been included.

This event harks back to an earlier era at NTID, when faculty regularly convened to share their scholarship, creating synergy and collaborations. Given the scholarship expectations of the university for annual appraisals and faculty promotion, this is our opportunity to come together in a semi-formal way to share what we have been working on.

Twenty eight presentations have been selected, as noted on the schedule, and will be held in SDC/1300 and SDC/1310. Ten posters will be presented during the hour after lunch, from 12:30-1:30 pm, on the second floor. Interpreting services are being provided by NTID’s Department of Access Services.

Kudos go to all the faculty and staff who submitted proposals for this event. The hard work and commitment demonstrated by these efforts is greatly appreciated, and sharing this work is vital to our continued collaboration, creativity, and energy. To continue this renewed tradition, a follow-up symposium is planned for October 12, 2015.
## Symposium Schedule

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<td>Austin Gehret, A Classroom-based Activity Designed to Enhance Student Comprehension of Enzyme Catalysis of Reaction Rate</td>
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<td>9:00-9:20</td>
<td>Linda Gotterdamer, Bonnie Bastian &amp; Raja Kushalnagar, Applicable Networking for Enhanced Communication Access</td>
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<td>Larry Quinsland &amp; David Templeton, Facilitating Student Writing</td>
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<td>Ann Hager, Making a Difference: Evaluating the Effectiveness of Faculty Tutoring and Academic Support</td>
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<td>10:15-10:35</td>
<td>Gary Behm, Raja Kushalnagar, Joseph Stanislow &amp; Aaron Kelstone, Enhancing Accessibility of Classroom Lectures for Deaf and Hard of Hearing Students: Real-time Tracking Display in Classrooms</td>
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<td>Vicki Robinson, Teaching in a 3-D Immersive Virtual Laboratory</td>
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<td>Jim Mallory, Virtual World Enhances Student Learning in Computer Hardware Classes</td>
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<td>Kurt Stoksporf &amp; Heather Smith, Enhancing Accessibility of Information Used in a Blended Classroom Experience Using QR Codes</td>
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<td>Patti Durr &amp; Karen Christie, Looking Into 'The HeART of Deaf Culture: Literary and Artistic Expressions of Deafhood'</td>
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<td>Kim Kurz, Jason Listman &amp; Peter Hauser, Deaf Professionals’ Resilience: A Qualitative Study</td>
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<td>Gary Behm &amp; Brian Trager, The Challenges and Rewards of “The Baobab” Storybook App</td>
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<td>Erin Esposito, SWOT Analysis of Integrating Social Media in the Classroom</td>
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<td>3:10-3:30</td>
<td>Gary Blatto-Vallee, Susan Foster, Jane Jackson, Carol Marchetti, Jacqueline McGill &amp; Keith Mousley, Project Thinking CAP: Communication, Access, &amp; Persistence Among Deaf And Hard Of Hearing Students In Foundational Statistics Courses</td>
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<tr>
<td>4:00-5:00</td>
<td>Reception — Ellie’s Place</td>
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### Poster Sessions — 12:30-1:30

**Showcasing Student Learning using Portfolios and e-Portfolios**

**Tracy Magin, Lecturer, Department of Business Studies**

**Kathleen Szczepanek, Senior Lecturer, Department of Business Studies**

**Mary Beth Parker, Associate Professor, Department of Business Studies**

**Adriana Kulakowski, Lecturer, Department of Business Studies**

Our poster session will display how portfolios and e-portfolios are used in our Administrative Support Technology program to showcase student work. Students who use a portfolio during the interview process are able to show solid evidence of their skills and abilities.

Students in our program start developing a paper portfolio within their first year here. We then use our Business Graphics and Desktop Publishing courses to guide students through planning, creating, organizing and personalizing e-portfolios by maximizing the tools available in Adobe Acrobat XI Pro. E-portfolios are an effective way to showcase student work and are easy to create.
Microsoft Office Specialist (MOS) Certification training program for deaf, hard-of-hearing and hearing university employees.

Tracy Magin, Lecturer, Department of Business Studies
E. William Clymer, Associate Professor, Department of Business Studies

The NTID Department of Business Studies offers an Administrative Support Technology (AST) program that prepares deaf students for a career in a variety of business settings including government, education, corporate and health care.

Students can prepare for the Microsoft Office Specialist program by enrolling in a full semester class, taught by experienced teachers of the deaf, in specially designed business labs that facilitate communication. Students can receive certification for the current versions Microsoft Word, PowerPoint, Excel and Access.

Gmetrix online preparation software is used to guide students in practice. Certiport training and assessment sessions, could be used to improve the skills of college’s workforce. A significant element of the plan was the availability of specially designed computer labs and software, could be used to improve the skills of professional American Sign Language (ASL) interpreters.

Gmetrix online preparation software is used to guide students in practice. During June 2014, seventeen professional staff and one faculty member participated in weeklong training and assessment sessions, focusing primarily on Word and PowerPoint. An additional one-week workshop was offered during July 2014, with 5 staff from the first group continuing their training along with two new participants. Certification results were documented for all 20 unique participants, with detailed feedback on the experience being recorded for 18 participants.

During the first workshop meeting the features of the Gmetrix training system were demonstrated. When participants were ready for assessment, the Certiport assessment system was explained. A pre-test was available for each participant interested in knowing their current level of skill prior to training. After the initial orientation to the workshop, participants were able to work at their own pace. The instructor was available to respond to content and process questions.

Methods

Prior to acceptance to the MOS workshop, participants responded to a skills survey to ensure they were at an intermediate skill level for the application they have selected.

All communication during workshop activities was in simultaneous communication. During the first workshop meeting the features of the Gmetrix training system were demonstrated. When participants were ready for assessment, the Certiport assessment system was explained. A pre-test was available for each participant interested in knowing their current level of skill prior to training. After the initial orientation to the workshop, participants were able to work at their own pace. The instructor was available to respond to content and process questions.

Results

Of the twenty individuals enrolled in the workshops, 12 tested for certification, with 10 individuals passing. This represents an 84% success rate. 64% of participants attempted to complete two certifications during their one-week workshop, with no one being successful. The overall satisfaction and importance of the training was extremely high. 76% found the complexity of the skills needed to obtain MOS certification to be either somewhat or extremely high. 76% found the complexity of the skills needed to obtain MOS certification to be either somewhat or extremely high. 76% found the complexity of the skills needed to obtain MOS certification to be either somewhat or extremely high. 76% found the complexity of the skills needed to obtain MOS certification to be either somewhat or extremely high. 76% found the complexity of the skills needed to obtain MOS certification to be either somewhat or extremely high. 76% found the complexity of the skills needed to obtain MOS certification to be either somewhat or extremely high. 76% found the complexity of the skills needed to obtain MOS certification to be either somewhat or extremely high. 76% found the complexity of the skills needed to obtain MOS certification to be either somewhat or extremely high. 76% found the complexity of the skills needed to obtain MOS certification to be either somewhat or extremely high. 76% found the complexity of the skills needed to obtain MOS certification to be either somewhat or extremely high. 76% found the complexity of the skills needed to obtain MOS certification to be either somewhat or extremely high. 76% found the complexity of the skills needed to obtain MOS certification to be either somewhat or extremely high. 76% found the complexity of the skills needed to obtain MOS certification to be either somewhat or extremely high. 76% found the complexity of the skills needed to obtain MOS certification to be either somewhat or extremely high. 76% found the complexity of the skills needed to obtain MOS certification to be either somewhat or extremely high. 76% found the complexity of the skills needed to obtain MOS certification to be either somewhat or extremely high. 76% found the complexity of the skills needed to obtain MOS certification to be either somewhat or extremely high.
Evaluating Speech and Sign Recognition as the NTID Speech Recognition Test will be provided. This test, known as the NTID Speech Recognition Test (NSRT), has been under development for a number of years, and it is currently available at http://apps.ntid.rit.edu/NSRT/.

The second part of the talk addresses the transmission of sign for purposes of acquiring ASL as a second language. A novel approach to the measurement of sign recognition ability will be described. An overview of initial findings from two studies will be presented along with the next steps involved in the development of a computer-based adaptive test of ASL proficiency.

STATEMENT OF THE PROBLEM: To describe the relationship between retrospective communicative stress and current depressive symptomatology in a sample of 143 DHF late adolescent and young adults in USA.

SUBJECTS: Following IRB approval by the local institution, 143 deaf and hard of hearing college students who were 18 or over were recruited and administered questionnaires related to language history and current psychological functioning. We included participants who have diagnoses of depression, anxiety and substance abuse.

PROCEDURE: Self-rating language proficiency, communicative history, and Beck Depression Inventory- Short Form questionnaires were administered. Retrospective communicative stress is measured by questions that asked the participant to retrospectively report how much his/her mother and father understood what they said. Logistic regression models were used to estimate the likelihood of having depression that is associated with communicative stress history after controlling for gender, hearing level, and abuse history.

RESULTS: Approximately 27% of our study sample has a history of communicative stress where participants reported understanding some to little of what their mother or father said. In all models, significant odds ratio indicates that reports of communicative stress history increased the odds of depression symptomatology. There are gender-specific variations in the association between the individual’s gender and communication with mother and father. The odds ratio indicates that when holding all other variables constant, a man who retrospectively reports being able to understand some to none of what his father said is 11 times more likely to report depressive symptomatology than a man who retrospectively reports being able to understand most or all of what his father said. Similarly, a female who reports a history of communicative stress with her mother is nearly 6.6 times more likely to report depressive symptomatology that is greater than typical level. Although not significant, females and males who were abused during their childhood years were at least twice likely to report depression in adulthood.

CONCLUSIONS: Although our study findings suggest that DHF men and women with history of communicative stress are at risk for depression in adulthood, they do not provide information on the causal mechanisms linking communicative stress early in life and depression later in life. Greater attention should be given to promoting healthy communication between DHH girls and their mothers as well as DHH boys and their fathers, which might reduce the impact on later emergence of depression in the DHH individual.

Written with Sheila Bruce (NTID cross registered student), Tina Sutton, and Irene W. Leigh
Emergent technologies now extend beyond peripherals, with machines penetrating our very flesh. Technology therefore is no longer conceptually delineated by terms such as “online” or “offline,” or “real” or “virtual.” With implanted technology, we begin to blur the lines between traditional Cartesian binaries of mind and body, machine and human, natural and artificial, ability and disability. Integration and embodiment such as this (as George Lakoff and Mark Johnson show), informs how we both organize and ingest information. We construct bodies of knowledge based on what we know of our own bodies; based on how we construct ourselves. With the marked increase of what some call “cyborg technologies,” questions of embodiment and attendant ethics must be addressed.

Cochlear implant (CI) technology may be generating new bodies of knowledge that are made manifest in cultural discourse. In order to further acknowledge and understand the diverse and evolving group that comprises cochlear implant users, we need to find out not only where and when a CI identity is being constructed and shaped by cultural discourse, but if so, how is it being constructed and how is it being received. The questions are these: how are people with CI presented in media, and how might these representations affect us as students, teachers, as intellectuals, and as users of technology?

This presentation for ICED (part of an ongoing, larger project), begins to explore these questions. While the larger study is an analysis of what Brenda Brueggeman calls “implanting rhetoric” as it appears in a variety of cultural discourse media (in print, on film, in social media), the current study focuses specifically on representations of CI on television shows in the U.S. in the last half-decade and will display the findings of that analysis. As technology becomes more and more “implanted” in our personal, professional, and academic lives, and in the lives of our students, rhetorical messages about CI and the ways in which they influence our perceptions and our identity formation will of necessity become vital areas of contention and exploration. Sooner or later, as educators, we will most likely have students in our classrooms who not only “interface” with technology, but who are actually, biologically integrated with technology. Some of us will be thus integrated, if we aren’t already. My study, as it examines media rhetoric and audience cultivation, serves as a starting point for further interrogation of the representation, reception, and internalization of CI in cultural discourse and its broader significance.

Have We Come a Long Way? Moving Disability into the Framework of the Diversity Model for Organizations and Career Development
Charlotte Thoms, Ed.D., Associate Professor, Department of Business Studies

Time: 9:00-9:20 am
Place: SDC/1300

This workshop introduces a new framework of disability in the diversity model in an effort to encourage scholarship to expose the richness of disability within the context of diversity. As laws continue to protect the rights of people with disabilities, this growing group will inevitably evolve into a major culture where disability is envisioned more as different ability. Thereby compelling the development of more intense research into the experiences shared between hearing and deaf/hard-of-hearing individuals.

Specific goals include demonstration and review of our beta testing efforts with Transcense (color-coded voice recognition app—Developers at UC Berkeley), InnoCaption (live stenographer capturing support for mobile phone calls—Developers at InnoCaption, Inc., based in California and Kansas), and Project Echo (speech frequency transposition app—Developers at Syrinx, Boston, MA); and update of current apps available that might benefit deaf or hard-of-hearing individuals in-the-job communication.

At the conclusion of the presentation participants will have the opportunity to ask questions and experiment with a variety of apps.
elements of an inclusion model of diversity with disability as one of the integral components instead of the two models presently utilized.

As educators and human resource development professionals become more accepting of individuals' abilities and view them as different abilities and not with a negative dis/ability perception, value will be assigned to people with “different” abilities without labeling or stigmatizing those differences. Disability Studies in Education (DSE) opens the door for full inclusion of individuals with different abilities in all aspects of society. Leaders in organizations, practitioners, and educators who are responsible for career development are better for walking through the door with an understanding of where they developed their perceptions of the integration of people with different abilities into the educational arena and ultimately into the workplace.

The way disability is defined and understood has changed in the last decade. In the past, identifiers characterized persons with disabilities as limited, incapable, and in need of a cure. These descriptors were used to represent degrees of inability that moved on a continuum seeking to arrive at that utopian “normal” ability. “What is normal?” Because of the tensions, ideological differences, and conflicts in terminology as it relates to disability in diversity, the two prevailing models in DSE will be discussed. The proposed new model champions the causes that have been questioned by opponents of both models and used by past and present academicians and practitioners. Those questions are a catalyst for the evolution of the proposed new model that is more reflective of the global, diverse phenomenon educators face as they prepare students for a transculturized society and global workplace (Thoms & Burton, 2015).

Join me for a summary of my book chapter entitled “Understanding the Impact of Inclusion in Disability Studies Education” from the 2015 publication, Impact of Diversity on Organization and Career Development. This workshop will stimulate a robust discussion while fully acknowledging that progress has been made for the inclusion of disability in diversity; however, the ongoing integration and inclusion of persons with disabilities still have a long way to go (Jaeger & Bowman, 2005).

Facilitating Student Writing

Larry Quinsland, Ph.D., Professor, Department of Science and Mathematics
David Templeton, Associate Professor, Department of Science and Mathematics

Time: 9:25-9:45 am Place: SDC/1300

How can teachers introduce activities designed to enhance the ability and motivation of students to express themselves in writing?

We have a history of both in and out of the classroom writing experiences going back to the early 80’s. Our presentation will describe the process of designing materials and leading discussions that enhance the student cognitive process of written English competencies. We will use STEM context to illustrate the philosophy and processes applied to the design and implementation of writing activities.

Deaf and Hard of Hearing in Academia: Conversations about Career Pathways, Networking and Mentoring

Susan Foster, Ph.D., Professor, Master of Science in Secondary Education
Denise Kavin, Ed.D., Lecturer, Department of Liberal Studies
Susan Foster, Ph.D., Professor, Master of Science in Secondary Education

Abstract: Home to the National Technical Institute for the Deaf, RIT has more DHH faculty than any other mainstream university in the world. The social science component of AdvanceRIT capitalized on this diversity to explore the experiences of two underrepresented subgroups of women faculty - women of color (WoC), and deaf and hard of hearing (DHH) women.

In this poster session we share results from focus group interviews with DHH woman faculty. Topics covered include career pathways, mentoring and networking. Each topic will be described with examples from the interviews. The poster presenters will engage visitors in discussions about the results and areas for future study.

Student-Generated Concept Maps: Active Ownership of Learning

Michael Kane, Lecturer, Department of Business Studies

The last four academic years, I taught eight “Cost Accounting” classes – three sections of Cost Accounting I (0801-252/quarter); two sections of Cost Accounting II (252-253/quarter); and three sections of Accounting 3 (NACC-203/semester). Accounting 3 topics focus on the use of materials, labor and factory overhead by manufacturers during production cycles. I utilize concept maps as a teaching and learning strategy in all of my accounting classes. Concept maps are visual representations of ideas indicating interconnecting relationships between those ideas on paper. The numerous concept maps that I create during the academic year serve many purposes: a visual guide during lectures, an on-the-spot comprehension check; an assessment tool in lieu of essay or multiple-choice questions in tests; a homework assignment; a study guide; and a visual aid for my flipped classroom lectures.

Significance

In my classroom, I switched from teacher-generated concept maps to concept maps generated by students themselves. When my students generate concept maps on their own, they become active learners while undergoing a highly cognitive activity. A recent $1,000 Dr. Frank B. Sullivan Memorial Foundation grant gave my Accounting 3 students the opportunity to explore their preferences between two prominent concept-mapping software: MindView™ and Inspiration™. They used those two software to create their own concept maps incorporating teacher-assigned topics and vocabulary terms in each chapter throughout this semester.

Method

For each chapter, each student creates two concept maps utilizing MindView™ and Inspiration™ for himself and for his classmates. Each student also had the benefit of a teacher-generated concept map (given out as an additional reference on the day before the chapter test is administered).

Results

Twelve Accounting 3 students – seven from last academic year and five this academic year – were observed creating their own maps in the classroom. Data from the “Student-Generated Concept Maps” surveys will be summarized and distributed via handouts during the NTID Scholarship Symposia.

Conclusions

Two significant findings from the completed surveys indicate strong student preferences. A significant finding is that the vast majority of students prefer student-generated maps over teacher-generated maps. Another significant finding is that all five students for this academic year prefer using Inspiration™ software as opposed to using MindView™ due to its ease of utilizing different features offered by Inspiration™.

Poster Sessions – 12:30-1:30
Cochlear Implant Training With Fading Visual Cues for Prelingually Deaf Adults

Catherine Clark, Au.D., Associate Professor, Department of Communication Studies
Carol DeFilippo, Ph.D., Professor, Master of Science in Secondary Education

The purpose of the study was to assess progressively diminished lipreading cues as a training technique (Erber, 1979) for triggering neuroplasticity in adult prelingually-deaf cochlear implant (CI) users. CI outcomes vary greatly when the presumed age for establishing normal auditory pathways has passed (Bavelier & Neville, 2002; Capoosecco, 2012). Given life-long use of lipreading and/or sign language, brain reorganization seems irreversible, resulting in visual dominance (Gilley et al., 2008; Moody-Antonio et al., 2005) and frustration with auditory training. Exceptional cases of open-set speech perception (Waltzman et al., 2002; Yang et al., 2011), however, support results of training studies that demonstrate learning-dependent plasticity in this population (Fu & Galvin, 2008). We hypothesized that intensive audiovisual speech training with diminishing visual cues (van Wassenhove et al., 2005; Verhoeff & Bernstein, 2009) would effect change in the neural representation of speech in the non-primary auditory pathways (Gordon et al.,2003), thus increasing CI benefit (Huyse et al., 2013).

Methods/Results: Seven adult prelingually-deaf CI recipients participated in a multiple-baseline-across-subjects and conditions training study (Barlow et al.,2009). Subjects were 23-29 years old, implanted at age 9-25. Our 6 unilateral subjects reported understanding only a few words through listening alone; the one bilateral user reported understanding about half. Training consisted of viewing audiovisual clips of 6 talkers speaking VCV syllables in 5 conditions: one unmodified and four with progressively diminished lipreading cues. Individual training gains were defined as change in the most degraded condition, from baseline to final block. Four participants’ scores improved for all 3 consonants by 5.6%-18.5%; three participants achieved gains of 1.8%-31.5% for 2 of the consonants. Pre/post gains for CUNY sentences were defined as change in amount of auditory enhancement (unmodified AV word-recognition scores relative to V-only scores). Four subjects’ scores achieved an additional 4%-19% auditory enhancement after training. These included the bilateral CI user and two subjects who reported the least CI use and benefit prior to the study.

Subjects said the regimen was challenging, but they liked seeing faded conditions mixed with clear conditions and getting instant feedback. They also reported the following: • Wished training could be extended • Investigating upgrades • Became re-invested in the cochlear implant • Enrolled in speech therapy • Obtained new maps • Initiated regular listening practice

Conclusions: Results suggest that the new training protocol with diminishing visual cues can benefit adult prelingually-deaf CI recipients with diverse listening characteristics, though not all individuals showed positive gains or enhancement as measured. For those whose auditory benefit was not captured by the planned measures, learning trajectories for intermediate conditions of diminished visual cues indicated emerging awareness of auditory place-of-articulation features. Future efforts will focus on replicating training effects with extended training time and an expanded stimulus set, and documenting resultant neurological changes to supplement our behavioral evidence for learning-dependent plasticity.
This presentation is a summary of a study done to test a model of interpretation that defined “meaning” at three levels (literal, enriched, implicature) and which addressed both semantic and pragmatic “sense.” The work of various authors in pragmatics (Bach, 2006; Grice, 1989; Sperber & Wilson, 1995) as well as spoken language interpretation (Blum-Kulka, 2000; Gumul, 2006) and sign language interpretation (Cokely, 1992; Livingston, Singe & Abramson, 1995; Russell, 2002) were a literal translation of the interpreters’ ASL utterances and the function and meaning of entire sentences and their communicative roles in their broader contexts. This poster session presentation summarizes the focus of this grant-supported research, the targeted verb properties, the characteristics of the research participants, the assessment methodology employed, and the results of one of the Year 1 analyses from the Transitivity/Intransitivity subtask.

The research reported here is a selection of Year 1 results from the authors’ NTID/RICTS NSF grant BCS-1251342 focusing on “Deaf Learners’ Acquisition of English Verbs and Their Component Properties.” This three and a half year grant focuses on deaf college students’ knowledge of fundamental properties of English verbs that determine the kinds of sentence structures that specific verbs are associated with, the functions of the constituents (subjects, objects, prepositional phrases, etc.) that comprise these sentence structures, and the function and meaning of entire sentences and their communicative roles in their broader contexts. This poster session presentation summarizes the focus of this grant-supported research, the targeted verb properties, the characteristics of the research participants, the assessment methodology employed, and the results of one of the Year 1 analyses from the Transitivity/Intransitivity subtask.

The poster outlines the motivation for this NSF grant research and the specific focus of the Year 1 agenda, which includes transitivity/intransitivity, semantic roles, and argument realizations and alternations subtasks. It describes the targeted research participants, who are (i) deaf NTID students representing three English proficiency levels based on scores on the Michigan Test of English Language Proficiency and two comparison groups: (ii) hearing second language (L2) English students at the same three Michigan Test-based proficiency levels and (iii) hearing RIT students who are native-English speakers. A sample of STEM English text is provided to illustrate the prevalence of (color-coded) transitive and intransitive verb types—and especially passive verb forms—in STEM discourse. The format and sample items from the 6-point sentence acceptability rating-scale task are also illustrated. The general overall results of the Year 1 research agenda are briefly summarized, and the results of a specific analysis showing participants’ relative knowledge of four passive sentence types are provided in graph form with sample sentence types and hypothesized performance.

This analysis demonstrated that the deaf and the L2 English participants performed as hypothesized and exhibited a roughly parallel performance pattern at each Michigan proficiency level, with the exception of the Low-Michigan deaf group. This group could not discriminate among the four grammatical and ungrammatical sentence types, with the implication that their reading comprehension and written expression of text containing these fundamental verb structures would be seriously compromised.

Finally, the poster provides a flow-chart of the anticipated impact of this NSF grant research, bottom-up from a greater understanding of the mental English verb lexicons of deaf students, leading to improved English teaching methods and materials, leading to students’ improved sentence-level comprehension and production, leading to improved management of English discourse, leading to greater educational performance and outcomes and improved prospects for career success.

Assistants: Erin Finton and Kim Persky
appears to be strong evidence to support the notion that this positive effect is suppressed for persons with disabilities, when compared to persons without disabilities. The implications of these findings are significant, especially for persons with disabilities who are also potential consumers of postsecondary education. Contextually, these findings must be understood within the larger conversation surrounding workplace parity, inclusive of employability, earnings, and promotion, along with the subsequent barriers present in each of the aforementioned workplace components. Subsequent discussion will consist of the differentiated circumstances associated with each disability type, and the importance of continued research in the areas of stigma and stereotype theory.

Ethnic Enclaves and Their Application to the Deaf Community

Scot Atkins, Ed.D., Assistant Professor, Department of Business Studies

Time: 3:35–3:55 pm
Place: SDC/1310

Ethnic enclaves are communities that have a high concentration of businesses and agencies owned and operated by members of the same cultural/linguistic group. This presentation outlines existing literature on ethnic enclaves with the goal of applying the concept of ethnic enclaves to the Deaf Community. This is supported by recent events in the Deaf community such as trade shows, and the sociological desire for a “place of their own”. The most recent emerging example of this is Gallaudet University’s intent to develop land adjacent to the campus with the vision of having Deaf people live, work, shop and play in one location. Ethnic enclaves are considered to be “springboards” for members of ethnic minority groups to expand their business opportunities to the greater community.

Presentation Description:

There has been growing recognition that the Deaf community is a specific socio-cultural group with its own norms and dynamics. This paper presents existing literature on ethnic enclaves with the goal of applying the concept of ethnic enclaves to the Deaf Community in future research. This analogy to well-established ethnic enclaves is supported by recent socio-economic events in the Deaf community such as national and international trade shows, the proliferation of enabling technology, and the sociological desire for a physical location in which Deaf people may interact, reside and shop. Perhaps the most compelling example of this is Gallaudet University in Washington, DC, which is currently developing land adjacent to the campus for mixed-use development, with the vision of having Deaf people live, work, shop and play in one location. There will be a brief discussion on the possible application of this concept in communities like Rochester. Does it need to happen organically or must it be supported through a planned infrastructure?

The paper focuses on the greater framework of ethnic enclave theory and how that concept may be applied to the Deaf Community.

Objectives:

Participants will learn and understand the existing definition of “ethnic enclaves”.

Participants will understand the different examples of ethnic enclaves in the general community and to understand the socio-cultural basis for the phenomena of ethnic enclaves.

Participants will learn about some the history surrounding the attempt to create such enclaves within the Deaf community over the years.

Participants will learn about some of the drivers that may serve as catalysts towards this concept.

Participants will obtain a glimpse into what is happening within the Deaf Community as it pertains to the ethnic enclave framework, especially with regard to the Gallaudet community.

Changes in Students’ Self-Ratings on the L/CBQ from Entry to Capstone

Marianne Gustafson, Professor and Associate Dean for Special Projects, Academic Affairs

Ronald Kelly, Ph.D., Professor, Master of Science in Secondary Education

Lawrence Scott, Associate Professor, Department of Communication Studies

Time: 10:15–10:30 am
Place: SDC/1310

The Language/Communication Background Questionnaire (L/CBQ) is completed by all incoming NTID deaf and hard-of-hearing (D/H) and baccalaureate degree students annually. Students complete the survey online prior to arrival on campus. The L/CBQ is designed to query students on their communication preferences, history of access services received, hearing and cochlear implant use, age they began using American Sign Language (ASL), and self-perceptions of speech, speech-reading, listening, sign language, and simultaneous communication receptive and expressive skills. Many of the L/CBQ survey items ask students to rate themselves on a five-point scale, with the responses varying based on the question. The L/CBQ is used for a variety of purposes, such as SVP Career Seminar placement, RIT housing, anticipation of needed access services, statistical reporting of characteristics of incoming classes, and identification of potential students at risk in the classroom during their first term because of communication.

Anecdotally we “know” that deaf and hard-of-hearing students’ communication skills, preferences and self-perceptions change during their time at NTID/RIT as a result of interactions with other students and instructors with varied communication styles, exposure to various aspects of deaf culture, courses taken, and changes in their use of communication technologies (CI/HA/non-use/FM) and interpreters. Investigators sought to verify these perceptions by re-administering the L/CBQ to associate degree students close to graduation.

Students in AOS and AAS degree programs who were registered for the Capstone Seminar courses 0880-294 and 0882-297 during the last two academic years on quarters were invited to participate. Project initiators went to each section of the Capstone Seminar Courses and explained the project. Students were sent an e-mail with instructions and the link to complete the L/CBQ online. Self-Ratings of the 66 students (47% AOS and 53% AAS) who completed the L/CBQ while enrolled in Capstone were compared to their entry L/CBQ online. Self-Ratings of the 66 students (47% AOS and 53% AAS) who completed the L/CBQ while enrolled in Capstone were compared to their entry L/CBQ. For L/CBQ items that are categorical responses, Chi Square statistical tests were used and for items that required responses on a rating scale, t-tests for correlated means were used. Students’ ACT scores, gender, age, year at NTID when enrolled in Capstone, course histories, and co-op experiences were also analyzed.

Results indicated that there were statistically significant changes in many of the preferences and self-perceptions of communication from entry to Capstone L/CBQ completion. For example, when asked about how they prefer to express themselves, students near graduation trended toward higher preference for using sign language alone when communication with D/H and speech and writing when communication with hearing people who don’t know sign language. Additionally, when asked how well they thought hearing people understood their speech, there was a trend toward improved intelligibility in self-ratings and when asked to rate their sign language skills students tended to rate themselves as better when enrolled in Capstone Seminar than at entry.

In the proposed presentation, the co-investigators will describe the L/CBQ and its administration in this study, student demographics, L/CBQ questions and choices, and the results of comparing entry vs. Capstone Seminar surveys. Implications of this study will also be discussed with the NTID community.
Deaf Peer Tutoring: Writing Centers across the United States
Patricia Kenney, Lecturer, Department of Liberal Studies

This presentation will discuss a brief history of writing centers across the United States with a particular focus on deaf education. The introduction to writing-center history is important for three reasons. First, as Hauser and Marschark (2008) reported, only one in four deaf students will graduate from postsecondary programs across the United States. Such a high dropout rate in the deaf college student population is problematic and a concern for many scholars in the field of deaf education. I aim to investigate the general tutoring practices between advanced-English deaf peer tutors and deaf students and hope to offer implications for improving writing center practices for deaf students across the United States. Mainstream tutors who are interested in working with deaf students will benefit from this investigation. The investigation will have information on tutoring techniques used by advanced-English deaf peer tutors and their deaf tutees. Understanding this investigation may not only improve retention rates for deaf students across the United States but also offer greater career opportunities for advanced-English peer tutors in writing center and educational fields.

Second, writing centers in the United States have developed and continue to develop theories of writing instruction over the years since their inception in the 1930s (Murphy & Sherwood, 2008). These writing center theories have been developed largely to meet the writing needs of both native speaking and nonnative speaking tutees who are hearing. I aim to investigate additional theories that are more relevant to deaf student writers.

Lastly, research efforts to understand and improve writing instruction for deaf students in a writing center have been reported mostly from the perspectives of hearing tutors and hearing researchers across the United States. More specifically, research on deaf students and nonnative English speaking students is understood largely from the perspectives of the traditional, white, native English-speaking concepts, seemed to be missing. A virtual lab, requiring only a computer with a fast Internet connection and some readily available free software could bring the lab to homework, in an engaging and uncomplicated way. This presentation will address ways in which these virtual laboratory learning activities have been created and integrated with existing online testing and homework technologies.

Deaf Peer Tutoring: Writing Centers across the United States

Time: 10:40–11:00 am Place: SDC/1300

Mathematical Literacy Citizenship: Deaf Experience
Christopher A.N. Kurz, Ph.D., Associate Professor, Master of Science in Secondary Education

With an increased emphasis on mathematics as one of the gateways to successful academic experience, research has shown that deaf students were not provided with higher expectation or qualified instruction in mathematics, thus widening the learning gap between deaf students and their hearing peers (Pagliaro, 2010). Kliwer, Biklen & Kasa (2006) provide a framework of literate citizenship, how it can be applied in the academy, and how marginalized groups are affected by it. Deaf people are denied a literate citizenship based on the way we have traditionally characterized their literacy achievement (Schmitz, 2010). Deaf experience related to mathematical literacy citizenship is lacking in the literature.

Purpose
This study examines deaf experience in mathematical learning, according to the literacy citizenship framework. It is connected to ownership of mathematics, and also relates to being connected to the world through mathematics.

Method
This study employed a phenomenological research which deaf people were interviewed about their mathematical experience. Content analysis was used to identify common themes and extremes.

Results
The findings suggest deaf people are denied a mathematical literate citizenship based on the way we have traditionally characterized their academic achievement. Deaf participants felt they could pursue higher mathematics without being pulled back by their teachers of the deaf.

Conclusions
The study calls for teachers to help foster constructive pedagogy in the classroom. Deaf people should have the basic right to participate, contribute and interact with the world mathematically.

Mathematical Literacy Citizenship: Deaf Experience

Time: 3:10–3:30 pm Place: SDC/1310

The Effect of Educational Attainment on the Employment of Persons with Disabilities: A Non-Linear Approach
Richard Dirmeyer, Director, Institutional Research & Assessment
Denise Wellin, Senior Associate Director, Institutional Research

The study calls for teachers to help foster constructive pedagogy in the classroom. Deaf people should have the basic right to participate, contribute and interact with the world mathematically.
Today, it’s estimated that about 46% of college students are taking at least one course online. Online learning is proliferating and will continue to grow. According to Modern Language Association, ASL is one of the top three fastest growing languages on college campuses in the U.S. (Firatson, 2014). In 2009, ASL enrollments for higher education in the U.S. increased by 16.4% (Furman, Goldberg & Lusin, 2010). People expect to be able to work, learn, and study whenever and wherever they want to and online learning provides them this opportunity. Education paradigms are shifting to include online learning. The idea of learning ASL online in higher education is currently being explored, especially assessment tools used to measure success. Online learning, a type of distance learning, can be defined as the interaction of online learners in synchronous and asynchronous communication situations to share ideas, make connections with each other, and discuss information issues in an online course (Alexander Romiszowski and Robin Mason, 2004; Stefan Hrastinski). Online learning researchers have shown interaction to be a necessary component of online learning environments (Moore & Kearsley, 1995). Ms. Jennifer Briggs, a lecturer in the Department of American Sign Language & Interpreting Education (ASLIE) has been attending online training through the Wallace Center and working closely with Dr. Curt Radford in developing online classes for Beginning ASL I and II level classes. She created a short video giving instructions on how to navigate through MyCourses and other online resources for the faculty and staff of ASLIE.

This exploratory project is investigating the potential of Supplemental Online Learning Tools (SOLTs) that integrate visual representations of complex concepts with signed explanations to enhance the academic success of deaf and hard of hearing (DHH) students in foundational statistics courses. Visual/graphic and textual representation of concepts will be accompanied by sign language, voice and captioning. The project is supported by the National Science Foundation and is conducted through a partnership between the School of Mathematical Sciences in the College of Science and the Research Center for Teaching and Learning at the National Technical Institute for the Deaf. The diverse team of hearing and DHH members includes instructors, tutors, students, visual learning specialists and ASL interpreters. In the first year of the project, the research team developed a method to choose a course topic to address, collected and triangulated data, and developed materials for the first SOLT. Core objectives of this three-year project include developing a pilot collection of SOLTs for learning complex concepts in mainstream postsecondary settings and testing the efficacy of these videos in experimental and natural class settings.

I aim to investigate grammatical explanations during writing instruction by nonnative English speaking tutors and their deaf tutors for my dissertation study. Therefore, my presentation will introduce an overview of student’s learning comparing the virtual computer against that of students using traditional real computer hardware available in the lab. Students were challenged to troubleshoot a non-functioning computer in the virtual world. Two of Bloom’s Taxonomy of educational objectives were validated with this virtual world experiment.

After several years of experience in the area of Computer Hardware, the author is convinced that student learning can be enhanced on technical topics in virtual worlds such as Second Life®. In 2008, RIT established a presence in Second Life, one of several virtual world “grids” available in cyberspace. Professor Jim Mallory saw the immediate application to his work to bring computer hardware concepts and troubleshooting to a new level. Professor Mallory was able to prove two of Bloom’s taxonomy of educational objectives using Second Life and has statistical data to validate his results.

Professor Mallory created a 40-foot long motherboard complete with a CPU, socket and heat sink, monitor, RAM memory EIDE and SATA hard drives, etc. Student avatars could walk or fly through or around this virtual PC. They can click on a button and find out what the component name is and what it does. They could also disrupt the virtual PC’s functionality by unseating the video card, unplugging the power supply or any number of destructive things. Jim worked with some colleagues teaching similar PC hardware courses to measure
A Vocabulary Instruction Methodology for Deaf College Students
Eugene Lyulak, Ed.D., Professor, Department of Liberal Studies
Gary Blatto-Vallee, Lecturer, Department of Science and Mathematics

Time: 11:05–11:25 am Place: SDC/1310

Introduction
Deaf Education, Second Language Acquisition, and Applied Linguistics influenced the creation of the visual presentation of the vocabulary items in this study. The methodology simulated two important methods of learning new vocabulary not readily accessible to deaf students; incidental exposure of new vocabulary, and repeated visual exposure to Latin and Greek word roots.

Purpose
The study was constructed to gather data of pre-test and post-test measures of two groups of deaf college students’ performance and was used to assess vocabulary gain over a course of study of specific vocabulary items. Additionally, the online vocabulary program presented new vocabulary items in the context of class coursework, while the class-work taught strategies to identify word roots in a series of repeated visual exposures.

Methods
One group received interactive web-based instructional practice for a range of specific vocabulary items targeting word root development over an eleven week period, while another group received a standard online practice routine without the interactive practice over the same time period.

Results
The data indicated the interactive web-based group exhibited significantly greater mean gain scores on the post-test measure of vocabulary knowledge than the group that received the standard online instructional practice.

Conclusion
Targeted interactive vocabulary practice was an effective method to provide vocabulary practice opportunities outside the deaf classroom, and word root knowledge was a useful vocabulary learning strategy. Interactive practice through web-based applications can help broaden the English vocabulary knowledge of deaf students.

Deaf Graduates: Employed But Limited in Career Outcomes and Entrepreneurship
Ronald Kelly, Ph.D., Professor, Master of Science in Secondary Education

Time: 2:20–2:40 pm Place: SDC/1310

This survey study examined the careers of 1,196 deaf and hard of hearing alumni from one university compared to hearing alumni peers across ages 22 to 59. Deaf/hh respondents included alumni with 2-year associate degrees and 4-year baccalaureate degrees. Comparisons with hearing alumni peers only included those with 4-year degrees.

Surveys were sent to 3,579 deaf/hh alumni and 3,258 hearing alumni. The deaf/hh version included additional items assessing the use of sign language and verbal communications in the workplace. The response for the deaf/hh alumni was 33.4% and 28.9% for the hearing comparison group.

Deaf/hh alumni with 2-year degrees had negligible job promotions between ages 22 and 59, while those with 4-year degrees did better. In contrast, hearing peers with comparable 4-year degrees had a significantly higher probability of being promoted to all levels of management or becoming an owner/entrepreneur. Overall, deaf/hh were less satisfied with their jobs and careers; but, when satisfaction was further examined within the context of job status, the deaf/hh and hearing satisfaction responses were similar. Satisfaction for middle and senior managers was significantly higher than that of employees with no managerial responsibilities. With few exceptions, both deaf/hh and hearing participants responded similarly on the general self-efficacy scale and the constructs of career perceptions, entrepreneurial self-efficacy and career/personal scales. While the deaf/hh and hearing responses were similar, their promotion and career outcomes were different.

Co-authors: Andrew Quagliata [Cornell University, School of Hotel Administration], Richard DeMartino & Victor Perotti [RIT Saunders College of Business]
Presentations — 2:20-2:40

The Challenges and Rewards of “The Baobab” Storybook App
Brian Trager, Assistant Professor, Department of Information and Computing Studies
Gary Behm, Assistant Professor, Department of Engineering Studies

Time: 2:20–2:40 pm  Place: SDC/1300

In collaboration with Gallaudet University’s VL2 Center, faculty and students worked together in NTID’s Center on Access Technology and developed an Android and Windows version of the app after the initial development of the iOS version. The team had the opportunity to learn a new cross-platform software development for mobile apps. One of major advantages of the new cross-platform is the simplicity of the mobile application creation for all three different operating systems (iOS, Android and Windows). This is the type of skill that industry is looking for from the software developers.

The Baobab is an original story about a curious little girl who goes on a search for a rare, delicious fruit growing from an ancient Baobab tree. The little girl encounters animals and lands herself in a peculiar situation! Children will enjoy the daring little girl’s mishaps and adventures, the rich ASL storytelling, and the captivating watercolor illustrations.

• Interactive and bilingual ASL/English storybook app designed for visual learners, especially deaf children
• Original story, first developed through ASL storytelling and then told through English print
• Available on the App Store
• Design principles are based on research on science of learning on visual language and learning

App Highlights:
• Original story told in ASL and English
• Easy & accessible navigation designed for children
• Rich interactive narrative with direct English-to-ASL video translation
• 170-word American Sign Language glossary. Parents can learn ASL along with their child
• High resolution watercolor illustrations
• App design is based on proven research in bilingualism and visual learning

NTID engineering faculty members Brian Trager and Gary Behm headed the project, with Kelley Duran, Chris Santoro, and Shareef Ali’s support. Kelley Duran received a master’s degree in software engineering in December 2013. Chris Santoro, an information technology major graduated in May 2014. Shareef is in his 4th year in the BS Computer Science program.

LUNCH — 11:50am-12:30pm

POSTERS — SDC/1300 - 12:30-1:30pm

Descriptions of posters may be found on pages 24–31
Looking Into ‘The HeART of Deaf Culture: Literary and Artistic Expressions of Deafhood’

Karen Christic, Ph.D., Associate Professor Emeritus, Department of Cultural and Creative Studies

This presentation will demonstrate components of a multimedia interactive website created for instruction and learning in Deaf cultural studies courses. The website was developed as a result of our shared frustration with a strong-bilingual foundation, the HeART website was designed to promote critical and cultural literacy across a variety of Deaf cultural studies courses.

Specifically, the website includes historical timelines, text documents, video clips and sample works in the genres of Deaf visual art, ASL and English literature, Deaf theater and Deaf cinema. Interactive features guide the analysis of various artistic and literary works. For example, selected visual artworks have roll-over pop-up boxes which explain specific images and cultural symbols in the artwork. For a number of English poems, the interactive features promote a more visual appreciation via highlighted annotations, structural analysis, and poetic features. In addition, a number of brief videos were created to show how particular themes are expressed across a number of different genres.

The HeART website also includes in-depth interviews, which introduce students to thirteen Deaf scholars and creators who describe their own works and comment on the works of others. As a collection of stories about the Deaf experience throughout history, students develop an appreciation for artistic expression, Deaf cultural traditions and are often inspired to create new works. The website has been adopted for use in a number of Deaf cultural studies programs, ASL/Interpreting programs and as a resource for scholars.


Peter Haggerty, Associate Professor, Department of Liberal Studies

Professor Haggerty has worked almost exclusively with Deaf / HH first, second, and third year students at NTID taking writing courses, and with hearing students taking a required first-year writing course at RIT. The focus of these courses has been to develop students’ academic writing skills. In this “narration-as-knowledge” presentation, Professor Haggerty will present some thoughts on his teaching experiences in this context and on teaching in general.

Presentations — 1:30-1:50

Deaf Professionals’ Resilience: A Qualitative Study

Kim B. Karz, Ph.D., Assistant Professor and Chairperson, Department of American Sign Language & Interpreter Education
Jason Listman, Ed.D., Assistant Professor, Department of American Sign Language & Interpreter Education
Peter Hauser, Ph.D., Professor, Department of American Sign Language & Interpreter Education

Resilience is the human ability to “bounce back” and move on after having a bad experience. There are risk factors that interfere with people’s ability to “bounce back” while there are also protective factors that help them be resilient. This study specifically investigated the risk and protective factors that ten Deaf professionals, including Deaf doctors, professors, and educational administrators, have experienced in their lifetime. We specifically focused on the factors that helped them become resilient and successfully navigate their education and

“Watch Again and Again”: Flipped Classroom with Deaf College Students

Mindy Hopper, Ph.D., Lecturer, Department of Liberal Studies

The ultimate goal of this mixed-methods research study was to elicit the students’ responses about their experiences and perspectives about the “flipped classrooms” pedagogical approach utilized in their English classes. The overarching research question is: What are the students’ experiences and perspectives toward the “flipped classroom” pedagogical approach?

We elicited students’ feedback on the technology Dr. Hopper used for her English flipped classrooms. Such technology includes the provisions of videos that she uploaded in a course management server. The qualitative methodology enabled us to inquire and capture students’ voices, in other words, draw upon their understanding and underlying meanings of their experiences with the “flipped classroom” pedagogical approach. A triangulation of data sources were (1) pre-, mid-term, and post-

customized surveys from pilot phase, (2) Dr. Hopper’s memos, (3) pre- and post- customized surveys from the second phase, and (4) transcriptions from the videotaped group interview with students from developmental English classes. The interview was performed by Dr. Bryant who had taught these classes in the past, however they were not entirely in “flipped classroom” style. There were 8 participants in the 1-hour interview and it was held in a classroom near where students hang out and do computer work.

The purpose of the quantitative aspect of this study was to draw on the descriptive statistics from the surveys and generalize findings in terms of how helpful or clear such pedagogical tools were to the students as well as how comfortable they were with technology and language medium. During the pilot study, the surveys were disseminated at the beginning of mid-way occupation. The results of this study have important implications for educational programs as they highlight the factors Deaf individuals need in their lives for a successful education and career.

Presentations — 1:55-2:15

Deaf Professionals’ Resilience: A Qualitative Study

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Looking Into 'The HEART of Deaf Culture: Literary and Artistic Expressions of Deafhood'

Peter Haggerty, Associate Professor, Department of Liberal Studies

Time: 1:30–1:50 pm  Place: SDC/1300

This presentation will demonstrate components of a multimedia interactive website created for instruction and learning in Deaf cultural studies courses. The website was developed as a result of our shared frustration concerning not being able to easily find and access materials about the Deaf experience. Further, we sought to discover ways to make these materials accessible to our students both inside and outside of the classroom. As a visual textbook with a strong bilingual foundation, the HEART website was designed to promote critical and cultural literacy across a variety of Deaf cultural studies courses.

Specifically, the website includes historical timelines, text documents, video clips, and sample works in the genres of Deaf visual art, ASL and English literature, Deaf theater, and Deaf cinema. Interactive features guide the analysis of various artistic and literary works. For example, selected visual artworks have roll-over pop-up boxes, which explain specific images and cultural symbols in the artwork. For a number of English poems, the interactive features promote a more visual appreciation via highlighted annotations, structural analysis, and poetic features. In addition, a number of brief videos were created to show how particular themes are expressed across a number of different genres.

The HEART website also includes in-depth interviews, which introduce students to thirteen Deaf scholars and creators who describe their own works and comment on the works of others. As a collection of stories about the Deaf experience throughout history, students develop an appreciation for artistic expression, Deaf cultural traditions, and are often inspired to create new works. The website has been adopted for use in a number of Deaf cultural studies programs, ASL/Interpreting programs and as a resource for scholars.


Karen Christich, Ph.D., Associate Professor Emeritus, Department of Cultural and Creative Studies

Time: 1:30–1:50 pm  Place: SDC/1300

The focus of these courses has been year writing course at RIT. The students taking a required first- and underlying meanings of their experiences with the “flipped classroom” pedagogical approach. A triangulation of data sources were (1) pre-, mid-term, and post- and protective factors that ten Deaf professionals, including Deaf doctors, professors, and educational administrators, have experienced in their lifetime. We specifically focused on the factors that helped them become resilient and successfully navigate their education and occupation. The results of this study have important implications for educational programs as they highlight the factors Deaf individuals need in their lives for a successful education and career.

Resilience is the human ability to “bounce back” and move on after having a bad experience. There are risk factors that interfere with people’s ability to “bounce back” while there are also protective factors that help them be resilient. This study specifically investigated the risk factors in student resilience. Specifically, we elicited students’ responses about their own experiences and perspectives about the “flipped classroom” pedagogical approach utilized in their English classes. The overarching research question is: What are the students’ experiences and perspectives toward the “flipped classroom” pedagogical approach?

The ultimate goal of this mixed-methods research study was to elicit the students’ responses about their experiences and perspectives about the “flipped classroom” pedagogical approach utilized in their English classes. The overarching research question is: What are the students’ experiences and perspectives about the “flipped classroom” pedagogical approach? We elicited students’ feedback on the technology Dr. Hopper used for her English flipped classrooms. Such technology includes the provisions of videos that she uploaded in a course management server. The qualitative methodology enabled us to inquire and capture students’ voices, in other words, draw upon their understanding and underlying meanings of their experiences with the “flipped classroom” pedagogical approach. For example, selected visual artworks have roll-over pop-up boxes, which explain specific images and cultural symbols in the artwork. For a number of English poems, the interactive features promote a more visual appreciation via highlighted annotations, structural analysis, and poetic features. In addition, a number of brief videos were created to show how particular themes are expressed across a number of different genres.

The website includes historical timelines, text documents, video clips, and sample works in the genres of Deaf visual art, ASL and English literature, Deaf theater and Deaf cinema. Interactive features guide the analysis of various artistic and literary works. For example, selected visual artworks have roll-over pop-up boxes, which explain specific images and cultural symbols in the artwork. For a number of English poems, the interactive features promote a more visual appreciation via highlighted annotations, structural analysis, and poetic features. In addition, a number of brief videos were created to show how particular themes are expressed across a number of different genres.

The website also includes in-depth interviews, which introduce students to thirteen Deaf scholars and creators who describe their own works and comment on the works of others. As a collection of stories about the Deaf experience throughout history, students develop an appreciation for artistic expression, Deaf cultural traditions, and are often inspired to create new works. The website has been adopted for use in a number of Deaf cultural studies programs, ASL/Interpreting programs and as a resource for scholars.

Patti Durr, Associate Professor, Department of Cultural and Creative Studies

Time: 1:30–1:50 pm  Place: SDC/1310

Peter Hauser, Ph.D., Professor, Department of American Sign Language & Interpreter Education

Jason Listman, Ed.D., Assistant Professor, Department of American Sign Language & Interpreter Education

Peter Hauser, Ph.D., Professor, Department of American Sign Language & Interpreter Education

Time: 1:55–2:15 pm  Place: SDC/1300

The purpose of the quantitative aspect of this study was to draw on the descriptive statistics from the surveys and generalize findings in terms of how helpful or clear such pedagogical tools were to the students as well as how comfortable they were with technology and language medium. During the pilot study, the surveys were disseminated at the beginning of, mid-way through, and at the end of Fall Semester 2013 and it was felt that doing it three times was too much. As a result for the actual study, the surveys were disseminated twice – at the beginning of and at the end of Fall Semester 2014.

Both Dr. Hopper and Dr. Bryant employed the constructivist grounded theory methodology where coding across all data sources leads to common relationships or themes that explain the students’ experiences and perspectives of the “flipped classroom” style. Unique and striking points raised will be noted as well. Upon completion of data analysis, the researchers will share their interpretations of data. Prior to the analytical stage, a bilingual staff member transcribed the data. The purpose of the qualitative aspect of this study is not to generalize findings but to transfer assertions to other samples similar to our research participants.

“Watch Again and Again”: Flipped Classroom with Deaf College Students

Mindy Hopper, Ph.D., Lecturer, Department of Liberal Studies

Linda Bryant, Ed.D., Associate Professor, and Chairperson, NTID Learning Consortium

Time: 1:55–2:15 pm  Place: SDC/1310

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Kim B. Kurz, Ph.D., Assistant Professor and Chairperson, Department of American Sign Language & Interpreter Education

Linda Bryant, Ed.D., Associate Professor, and Chairperson, NTID Learning Consortium

Time: 1:55–2:15 pm  Place: SDC/1310

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As we submit this abstract, we have: (1) drawn descriptive statistics and some qualitative comments, (2) discovered themes from the actual study and (3) been gearing up to code the transcriptions from the group interview. Our plans are to continuing coding and cluster the themes to seek the underlying relationships to the students’ experiences of learning through the “flipped classroom” pedagogical approach. We hope by sharing our results, more faculty will become interested in using the flipped classroom approach in their classes.

**Presentations — 2:20-2:40**

The Challenges and Rewards of “The Baobab” Storybook App

Brian Trager, Assistant Professor, Department of Information and Computing Studies
Gary Behm, Assistant Professor, Department of Engineering Studies

Time: 2:20–2:40 pm  Place: SDC/1300

In collaboration with Gallaudet University’s VL2 Center, faculty and students worked together in NTID’s Center on Access Technology and developed an Android and Windows version of the app after the initial development of the iOS version. The team had the opportunity to learn a new cross-platform software development for mobile apps. One of major advantages of the new cross-platform is the simplicity of the mobile application creation for all three different operating systems (iOS, Android and Windows). This is the type of skill that industry is looking for from the software developers.

The Baobab is an original story about a curious little girl who goes on a search for a rare, delicious fruit growing from an ancient Baobab tree. The little girl encounters animals and lands herself in a peculiar situation! Children will enjoy the daring little girl’s mishaps and adventures, the rich ASL storytelling, and the captivating watercolor illustrations.

- Interactive and bilingual ASL/English storybook app designed for visual learners, especially deaf children
- Original story, first developed through ASL storytelling and then told through English print
- Available on the App Store
- Design principles are based on research on science of learning on visual language and learning

**App Highlights:**
- Original story told in ASL and English
- Easy & accessible navigation designed for children
- Rich interactive narrative with direct English-to-ASL video translation
- 170-word American Sign Language glossary. Parents can learn ASL along with their child
- High resolution watercolor illustrations
- App design is based on proven research in bilingualism and visual learning

NTID engineering faculty members Brian Trager and Gary Behm headed the project, with Kelley Duran, Chris Santoro, and Shareef Ali’s support. Kelley Duran received a master’s degree in software engineering in December 2013. Chris Santoro, an information technology major graduated in May 2014. Shareef is in his 4th year in the BS Computer Science program.

LUNCH — 11:50am-12:30pm

POSTERS — SDC/1300 - 12:30-1:30pm

Descriptions of posters may be found on pages 24–31

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Magnitude and Long-Division of Whole Numbers Is Crucial to Development of Fraction Skills

Keith Mousley, Associate Professor, Department of Science and Mathematics
Ronald Kelly, Ph.D., Professor, Master of Science in Secondary Education

Time: 11:30–11:50 am  Place: SDC/1310

Mathematical knowledge and skills especially in the area of fractions are central to subsequent learning of mathematics and extremely important to know in order to progress in upper level mathematics courses (Bailey, Siegler, & Geary, 2014). Research also shows that mathematics is linked to both college graduation and subsequent employment earnings for people in general (Rose & Betts, 2001), while quantitative literacy has been shown to directly impact employability (Rivera-Batiz, 1990). Knowledge of fraction magnitude promotes arithmetic fraction skill development (Bailey, Siegler, & Geary, 2014). Long division and fractions are related. Increasingly, research shows that students in the United States are falling behind many other countries in the area of mathematics.

Fractions are a major challenge for deaf and hard-of-hearing students. This presentation will report on the findings of DHH college students’ knowledge of fractions. A brief review of hearing students’ knowledge of fractions provides guidance and suggestions for what we can do to improve fraction skills of DHH students from elementary school through college.

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LUNCH — 11:50am-12:30pm

POSTERS — SDC/1300 - 12:30-1:30pm

Descriptions of posters may be found on pages 24–31
A Vocabulary Instruction Methodology for Deaf College Students
Kurt Stoskopf, Associate Professor, Department of Visual Communication Studies
Gary Blatto-Vallee, Lecturer, Department of Science and Mathematics
Eugene Lylak, Ed.D., Professor, Department of Liberal Studies

Time: 11:05–11:25 am
Place: SDC/1310

Introduction
Deaf Education, Second Language Acquisition, and Applied Linguistics influenced the creation of the visual presentation of the vocabulary items in this study. The methodology simulated two important methods of learning new vocabulary not readily accessible to deaf students; incidental exposure of new vocabulary, and repeated visual exposure to Latin and Greek word roots.

Purpose
The study was constructed to gather data of pre-test and post-test measures of two groups of deaf college students’ performance and was used to assess vocabulary gain over time.

A course of study of specific vocabulary items. Additionally, the online vocabulary program presented new vocabulary items in the context of class coursework, while the class-work taught strategies to identify word roots in a series of repeated visual exposures.

Method
One group received interactive web-based instructional practice for a range of specific vocabulary items targeting word root development over an eleven week period, while another group received a standard online practice routine without the interactive practice over the same time period.

Results
The data indicated the interactive web-based group exhibited significantly greater mean gain scores on the post-test measure of vocabulary knowledge than the group that received the standard online instructional practice.

Conclusion
Targeted interactive vocabulary practice was an effective method to provide vocabulary practice opportunities outside the deaf classroom, and word root knowledge was a useful vocabulary learning strategy. Interactive practice through web-based applications can help broaden the English vocabulary knowledge of deaf students.

Deaf Graduates: Employed But Limited in Career Outcomes and Entrepreneurship
Ronald Kelly, Ph.D., Professor, Master of Science in Secondary Education

Time: 2:20–2:40 pm
Place: SDC/1310

This survey study examined the careers of 1,196 deaf and hard of hearing alumni from one university compared to hearing alumni peers across ages 22 to 59. Deaf/hh respondents included alumni with 2-year associate degrees and 4-year baccalaureate degrees. Comparisons with hearing alumni peers only included those with 4-year degrees.

Surveys were sent to 3,579 deaf/hh alumni and 3,258 hearing alumni. The deaf/hh version included additional items assessing the use of sign language and verbal communications in the work place. The response for the deaf/hh alumni was 33.4% and 28.9% for the hearing comparison group.

Deaf/hh alumni with 2-year degrees had negligible job promotions between ages 22 and 59, while those with 4-year degrees did better. In contrast, hearing peers with comparable 4-year degrees had a significantly higher probability of being promoted to all levels of management or becoming an owner/entrepreneur. Overall, deaf/hh were less satisfied with their jobs and careers; but, when satisfaction was further examined within the context of job status, the deaf/hh and hearing satisfaction responses were similar. Satisfaction for middle and senior managers was significantly higher than that of employees with no managerial responsibilities. With few exceptions, both deaf/hh and hearing participants responded similarly on the general self-efficacy scale and the constructs of career perceptions, entrepreneurial self-efficacy and career/personal scales. While the deaf/hh and hearing responses were similar, their promotion and career outcomes were different.

Co-authors: Andrew Quagliata [Cornell University, School of Hotel Administration], Richard DeMartino & Victor Perotti [RIT Saunders College of Business]
Today, it’s estimated that about 46% of college students are taking at least one course online. Online learning is proliferating and will continue to grow. According to Modern Language Association, ASL is one of the top three fastest growing languages on college campuses in the U.S. (Firston, 2014). In 2009, ASL enrollments for higher education in the U.S. increased by 16.4% (Furman, Goldberg & Lusin, 2010). People expect to be able to work, learn, and study whenever and wherever they want to and online learning provides them this opportunity. Education paradigms are shifting to include online learning. The idea of learning ASL online in higher education is currently being explored, especially assessment tools used to measure success. Online learning, a type of distance learning, can be defined as the interaction of online learners in synchronous and asynchronous communicational situations to share ideas, make connections with each other, and discuss information issues in an online course (Alexander Romiszowski and Robin Mason, 2004; Stefan Hrastinski). Online learning researchers have shown interaction to be a necessary component of online learning environments (Moore & Kearsley, 1995). Ms. Jennifer Briggs, a lecturer in the Department of American Sign Language & Interpreting Education (ASLIE) has been attending online training through the Wallace Center and working closely with Dr. Curt Radford in developing online classes for Beginning ASL I and II level classes. She created a short video giving instructions on how to navigate through MyCourses and other online resources for the faculty and staff of ASLIE.

This exploratory project is investigating the potential of Supplemental Online Learning Tools (SOLTs) that integrate visual representations of complex concepts with signed explanations to enhance the academic success of deaf and hard of hearing (DHH) students in foundational statistics courses. Visual/graphic and textual representation of concepts will be accompanied by sign language, voice and captioning. The project is supported by the National Science Foundation and is conducted through a partnership between the School of Mathematical Sciences in the College of Science and the Research Center for Teaching and Learning at the National Technical Institute for the Deaf. The diverse team of hearing and DHH members includes instructors, tutors, students, visual learning specialists and ASL interpreters. In the first year of the project, the research team developed a method to choose a course topic to address, collected and triangulated data, and developed materials for the first SOLT. Core objectives of this three-year project include developing a pilot collection of SOLTs for learning complex concepts in mainstream postsecondary settings and testing the efficacy of these videos in experimental and natural class settings.

I aim to investigate grammatical explanations from the perspectives of advanced-English deaf peer tutors and their deaf tutors for my dissertation study. Therefore, my presentation will introduce an overview of students’ learning comparing the virtual computer against that of students using traditional real computer hardware available in the lab. Students were challenged to trouble shoot a non-functioning in the virtual world. Two of Bloom’s Taxonomy of educational objectives were validated with this virtual world experiment.
Deaf Peer Tutoring: Writing Centers across the United States
Patricia Kenney, Lecturer, Department of Liberal Studies

This presentation will discuss a brief history of writing centers across the United States with a particular focus on deaf education. The introduction to writing-center history is important for three reasons. First, as Hauser and Marschark (2008) reported, only one in four deaf students will graduate from postsecondary programs across the United States. Such a high dropout rate in the deaf college student population is problematic and a concern for many scholars in the field of deaf education. I aim to investigate the general tutoring practices between advanced-English deaf peer tutors and deaf students and hope to offer implications for improving writing center practices for deaf students across the United States. Mainstream tutors who are interested in working with deaf tutees will benefit from this investigation. The investigation will have information on tutoring techniques used by advanced-English deaf peer tutors and their deaf tutees. Understanding this investigation may not only improve retention rates for deaf students across the United States but also offer greater career opportunities for advanced-English peer tutors in writing center and educational fields.

Second, writing centers in the United States have developed and continue to develop theories of writing instruction over the years since their inception in the 1930s (Murphy & Sherwood, 2008). These writing center theories have been developed largely to meet the writing needs of both native speaking and nonnative speaking tutees who are hearing. I aim to investigate additional theories that are more relevant to deaf student writers.

Lastly, research efforts to understand and improve writing instruction for deaf students in a writing center have been reported mostly from the perspectives of hearing tutors and hearing researchers across the United States. More specifically, research on deaf students and nonnative English speaking students is understood largely from the perspectives of the traditional, white, native English-speaking concepts, seemed to be missing. A virtual lab, requiring only a computer with a fast Internet connection and some readily available free software could bring the lab to homework, in an engaging and uncomplicated way. This presentation will address ways in which these virtual laboratory learning activities have been created and integrated with existing online testing and homework technologies.

Mathematical Literacy Citizenship: Deaf Experience
Christopher A.N. Kurz, Ph.D., Associate Professor, Master of Science in Secondary Education

With an increased emphasis on mathematics as one of the gateways to successful academic experience, research has shown that deaf students were not provided with higher expectation or qualified instruction in mathematics, thus widening the learning gap between deaf students and their hearing peers (Pagliaro, 2010). Kliwer, Biklen & Kasa (2006) provide a framework of literate citizenship, how it can be applied in the academy, and how marginalized groups are affected by it. Deaf people are denied a literate citizenship based on the way we have traditionally characterized their literacy achievement (Schmitz, 2010). Deaf experience related to mathematical literacy citizenship is lacking in the literature.

Purpose
This study examines deaf experience in mathematical learning, according to the literate citizenship framework. It is connected to ownership of mathematics, and also relates to being connected to the world through mathematics.

Method
This study employed a phenomenological research which deaf people were interviewed about their mathematical experience. Content analysis was used to identify common themes and extremes.

Results
The findings suggest deaf people are denied a mathematical literate citizenship based on the way we have traditionally characterized their academics achievement. Deaf participants felt they could pursue higher mathematics without being pulled back by their teachers of the deaf.

Conclusions
The study calls for teachers to help foster constructive pedagogy in the classroom. Deaf people should have the basic right to participate, contribute and interact with the world mathematically.
Ethnic Enclaves and Their Application to the Deaf Community

Scot Atkins, Ed.D., Assistant Professor, Department of Business Studies

Time: 3:35–3:55 pm Place: SDC/1310

Ethnic enclaves are communities that have a high concentration of businesses and agencies owned and operated by members of the same cultural/linguistic group. This presentation outlines existing literature on ethnic enclaves with the goal of applying the concept of ethnic enclaves to the Deaf Community. This is supported by recent events in the Deaf community such as trade shows, and the sociological desire for a “place of their own”. The most recent emerging example of this is Gallaudet University’s intent to develop land adjacent to the campus with the vision of having Deaf people live, work, shop and play in one location. Ethnic enclaves are considered to be “springboards” for members of ethnic minority groups to expand their business opportunities to the greater community.

Presentation Description:
There has been growing recognition that the Deaf community is a specific socio-cultural group with its own norms and dynamics. This paper presents existing literature on ethnic enclaves with the goal of applying the concept of ethnic enclaves to the Deaf Community in future research. This analogy to well-established ethnic enclaves is supported by recent socio-economic events in the Deaf community such as national and international trade shows, the proliferation of enabling technology, and the sociological desire for a physical location in which Deaf people may interact, reside and shop. Perhaps the most compelling example of this is Gallaudet University in Washington, DC, which is currently developing land adjacent to the campus for mixed-use development, with the vision of having Deaf people live, work, shop and play in one location. There will be a brief discussion on the possible application of this concept in communities like Rochester. Does it need to happen organically or must it be supported through a planned infrastructure?

The paper focuses on the greater framework of ethnic enclave theory and how that concept may be applied to the Deaf Community.

Objectives:
Participants will learn and understand the existing definition of “ethnic enclaves".
Participants will understand the different examples of ethnic enclaves in the general community and to understand the socio-cultural basis for the phenomena of ethnic enclaves.
Participants will learn about some the history surrounding the attempt to create such enclaves within the Deaf community over the years.
Participants will learn about some of the drivers that may serve as catalysts towards this concept.
Participants will obtain a glimpse into what is happening within the Deaf Community as it pertains to the ethnic enclave framework, especially with regard to the Gallaudet community.

Changes in Students’ Self-Ratings on the L/CBQ from Entry to Capstone

Marianne Gustafson, Professor and Associate Dean for Special Projects, Academic Affairs
Ronald Kelly, Ph.D., Professor, Master of Science in Secondary Education
Lawrence Scott, Associate Professor, Department of Communication Studies

Time: 10:15–10:30 am Place: SDC/1310

The Language/Communication Background Questionnaire (L/CBQ) is completed by all incoming NTID deaf and hard-of-hearing (D/HH) associate and baccalaureate degree students annually. Students complete the survey online prior to arrival on campus. The L/CBQ is designed to query students on their communication preferences, history of access services received, hearing and cochlear implant use, age they began using American Sign Language (ASL), and self-perceptions of speech, speech-reading, listening, sign language, and simultaneous communication receptive and expressive skills. Many of the L/CBQ survey items ask students to rate themselves on a five-point scale, with the responses varying based on the question. The L/CBQ is used for a variety of purposes, such as SVP Career Seminar placement, RIT housing, anticipation of needed access services, statistical reporting of characteristics of incoming classes, and identification of potential students at risk in the classroom during their first term because of communication.

Anecdotally we “know” that deaf and hard-of-hearing students’ communication skills, preferences and self-perceptions change during their time at NTID/RIT as a result of interactions with other students and instructors with varied communication styles, exposure to various aspects of deaf culture, courses taken, and changes in their use of communication technologies (CI/HA/non-use/FM) and interpreters. Investigators sought to verify these perceptions by re-administering the L/CBQ to associate degree students close to graduation.

Students in AOS and AAS degree programs who were registered for the Capstone Seminar courses 0880-294 and 0882-297 during the last two academic years on quarters were invited to participate. Project initiators went to each section of the Capstone Seminar Courses and explained the project. Students were sent an e-mail with instructions and the link to complete the L/CBQ online. Self-Ratings of the 66 students (47% AOS and 53% AAS) who completed the L/CBQ while enrolled in Capstone were compared to their entry L/CBQ. For L/CBQ items that are categorical responses, Chi Square statistical tests were used and for items that required responses on a rating scale, t-tests for correlated means were used. Students’ ACT scores, gender, ages, year at NTID when enrolled in Capstone, course histories, and co-op experiences were also analyzed.

Results indicated that there were statistically significant changes in many of the preferences and self-perceptions of communication from entry to Capstone L/CBQ completion. For example, when asked about how they prefer to express themselves, students near graduation trended toward higher preference for using sign language alone when communication with D/HH and speech and writing when communication with hearing people who don’t know sign language. Additionally, when asked how well they thought hearing people understood their speech, there was a trend toward improved intelligibility in self-ratings and when asked to rate their sign language skills students tended to rate themselves as better when enrolled in Capstone Seminar than at entry.

In the proposed presentation, the co-investigators will describe the L/CBQ and its administration in this study, student demographics, L/CBQ questions and choices, and the results of comparing entry vs. Capstone Seminar surveys. Implications of this study will also be discussed with the NTID community.
was drawn upon to formulate the model. Twelve interpreters simultaneously interpreted a spoken English text into American Sign Language (ASL), and using the proposed model, a Deaf native signer and the principal investigator identified the occurrence of target utterances at the literal, enriched or implicature levels. Disregarding omissions, roughly half of the interpreters’ ASL utterances were a literal translation of the English source. However, forty percent were enriched in ASL as compared to the English narrative. The remaining ten percent of the interpreted utterances did not convey the logical form of the English source, but instead included a potential implicature. A review of triggers for enrichment and implicatures will be provided as well as cross-linguistic differences in the interpretation of semantic and pragmatic “sense.”
Cochlear Implant Training With Fading Visual Cues for Prelingually Deaf Adults

Catherine Clark, Au.D., Associate Professor, Department of Communication Studies
Carol DeFilippo, Ph.D., Professor, Master of Science in Secondary Education

The purpose of the study was to assess progressively diminished lipreading cues as a training technique (Erber, 1979) for triggering neuroplasticity in adult prelingually-deaf cochlear implant (CI) users. CI outcomes vary greatly when the presumed age for establishing normal auditory pathways has passed (Bavelier & Neville, 2002; Caposecco, 2012). Given life-long use of lipreading and/or sign language, brain reorganization seems irreversible, resulting in visual dominance (Giley et al., 2008; Moody-Antonio et al., 2005) and frustration with auditory training. Exceptional cases of open-set speech perception (Waltzman et al., 2002; Yang et al., 2011), however, support results of training studies that demonstrate learning-dependent plasticity in this population (Fu & Galvin, 2008). We hypothesized that intensive audiovisual speech training with diminishing visual cues (van Wasseneveet al., 2005; Verhoeff & Bernstein, 2009) would effect change in the neural representation of speech in the non-primary auditory pathways (Gordon et al., 2003), thus increasing CI benefit (Huys et al., 2013).

Methods/Results: Seven adult prelingually-deaf CI recipients participated in a multiple-baseline-across-subjects and conditions training study (Barlow et al., 2009). Subjects were 23-29 years old, implanted at age 9-25. Our 6 unilateral subjects reported understanding only a few words through listening alone; the one bilateral user reported understanding about half. Training consisted of viewing audiovisual clips of 6 talkers speaking VCV syllables in 5 conditions: one unmodified and four with progressively diminished lipreading cues. Individual training gains were defined as change in the most degraded condition, from baseline to final block. Four participants’ scores improved for all 3 consonants by 5.6%-18.5%; three participants achieved gains of 1.8%-31.5% for 2 of the consonants. Pre/post gains for CUNY sentences were defined as change in amount of auditory enhancement (unmodified AV word-recognition scores relative to V-only scores). Four subjects’ scores achieved an additional 4%-19% auditory enhancement after training. These included the bilateral CI user and two subjects who reported the least CI use and benefit prior to the study.

Subjects said the regimen was challenging, but they liked seeing faded conditions mixed with clear conditions and getting instant feedback. They also reported the following: • Wished training could be extended • Investigating upgrades • Became re-invested in the cochlear implant • Enrolled in speech therapy • Obtained new maps • Initiated regular listening practice

Conclusions: Results suggest that the new training protocol with diminishing visual cues can benefit adult prelingually-deaf CI recipients with diverse listening characteristics, though not all individuals showed positive gains or enhancement as measured. For those whose auditory benefit was not captured by the planned measures, learning trajectories for intermediate conditions of diminished visual cues indicated emerging awareness of auditory place-articulation features. Future efforts will focus on replicating training effects with extended training time and an expanded stimulus set, and documenting resultant neurological changes to supplement our behavioral evidence for learning-dependent plasticity.
elements of an inclusion model of diversity with disability as one of the integral components instead of the two models presently utilized. As educators and human resource development professionals become more accepting of individuals’ abilities and view them as different abilities and not with a negative dis/ability perception, value will be assigned to people with “different” abilities without labeling or stigmatizing those differences. Disability Studies in Education (DSE) opens the door for full inclusion of individuals with different abilities in all aspects of society. Leaders in organizations, practitioners, and educators who are responsible for career development are better for walking through the door with an understanding of where they developed their perceptions of the integration of people with different abilities into the educational arena and ultimately into the workplace.

The way disability is defined and understood has changed in the last decade. In the past, identifiers characterized persons with disabilities as limited, incapable, and in need of a cure. These descriptors were used to represent degrees of inability that moved on a continuum seeking to arrive at that utopian ‘normal’ ability. “What is normal?” Because of the tensions, ideological differences, and conflicts in terminology as it relates to disability in diversity, the two prevailing models in DSE will be discussed. The proposed new model champions the causes that have been questioned by opponents of both models and used by past and present academicians and practitioners.

Those questions are a catalyst for the evolution of the proposed new model that is more reflective of the global, diverse phenomenon educators face as they prepare students for a transculturized society and global workplace (Thoms & Burton, 2015).

Join me for a summary of my book chapter entitled “Understanding the Impact of Inclusion in Disability Studies Education” from the 2015 publication, Impact of Diversity on Organization and Career Development. This workshop will stimulate a robust discussion while fully acknowledging that progress has been made for the inclusion of disability in diversity; however, the ongoing integration and inclusion of persons with disabilities still have a long way to go (Jaeger & Bowman, 2005).

Facilitating Student Writing

Larry Quinsland, Ph.D., Professor, Department of Science and Mathematics
David Templeton, Associate Professor, Department of Science and Mathematics

Time: 9:25-9:45 am
Place: SDC/1300

How can teachers introduce activities designed to enhance the ability and motivation of students to express themselves in writing? We have a history of both in and out of the classroom writing experiences going back to the early 80’s. Our presentation will describe the process of designing materials and leading discussions that enhance the student cognitive process of written English competencies. We will use STEM context to illustrate the philosophy and processes applied to the design and implementation of writing activities.

The last four academic years, I taught eight “Cost Accounting” classes – three sections of Cost Accounting I (0801-252/quarter); two sections of Cost Accounting II (252-253/quarter); and three sections of Accounting 3 (NACC-203/semester). Accounting 3 topics focus on the use of materials, labor and factory overhead by manufacturers during production cycles. I utilize concept maps as a teaching and learning strategy in all of my accounting classes. Concept maps are visual representations of ideas indicating interconnecting relationships between those ideas on paper. The numerous concept maps that I create during the academic year serve many purposes: a visual guide during lectures, an on-the-spot comprehension check; an assessment tool in lieu of essay or multiple-choice questions in tests; a homework assignment; a study guide; and a visual aid for my flipped classroom lectures.

Deaf and Hard of Hearing in Academia: Conversations about Career Pathways, Networking and Mentoring
Susan Foster, Ph.D., Professor, Master of Science in Secondary Education
Denise Kavin, Ed.D., Lecturer, Department of Liberal Studies

Abstract: Home to the National Technical Institute for the Deaf, RIT has more DHH faculty than any other mainstream university in the world. The social science component of AdvanceRIT capitalized on this diversity to explore the experiences of two underrepresented subgroups of women faculty - women of color (WoC), and deaf and hard of hearing (DHH) women.

In this poster session we share results from focus group interviews with DHH women faculty. Topics covered include career pathways, mentoring and networking. Each topic will be described with examples from the interviews. The poster presenters will engage visitors in discussions about the results and areas for future study.

Student-Generated Concept Maps: Active Ownership of Learning
Michael Kane, Lecturer, Department of Business Studies

The the four academic years, I taught eight “Cost Accounting” classes – three sections of Cost Accounting I (0801-252/quarter); two sections of Cost Accounting II (252-253/quarter); and three sections of Accounting 3 (NACC-203/semester). Accounting 3 topics focus on the use of materials, labor and factory overhead by manufacturers during production cycles. I utilize concept maps as a teaching and learning strategy in all of my accounting classes. Concept maps are visual representations of ideas indicating interconnecting relationships between those ideas on paper. The numerous concept maps that I create during the academic year serve many purposes: a visual guide during lectures, an on-the-spot comprehension check; an assessment tool in lieu of essay or multiple-choice questions in tests; a homework assignment; a study guide; and a visual aid for my flipped classroom lectures.

Significance
In my classroom, I switched from teacher-generated concept maps to concept maps generated by students themselves. When my students generate concept maps on their own, they become active learners while undergoing a highly cognitive activity. A recent $1,000 Dr. Frank B. Sullivan Memorial Foundation grant gave my Accounting 3 students the opportunity to explore their preferences between two prominent concept-mapping software: MindView™ and Inspiration™. They used those two software to create their own concept maps during the academic year and five this academic year – observed creating their own maps in the classroom. Data from the “Student-Generated Concept Maps” surveys will be summarized and distributed via handouts during the NTID Scholarship Symposia.

Conclusions
Two significant findings from the completed surveys indicate strong student preferences. A significant finding is that the vast majority of students prefer student-generated maps over teacher-generated maps. Another significant finding is that all five students for this academic year prefer using Inspiration™ software as opposed to using MindView™ due to its ease of utilizing different features offered by Inspiration™.

Presentations — 9:25-9:45

Deaf and Hard of Hearing in Academia: Conversations about Career Pathways, Networking and Mentoring
Susan Foster, Ph.D., Professor, Master of Science in Secondary Education
Denise Kavin, Ed.D., Lecturer, Department of Liberal Studies

Student-Generated Concept Maps: Active Ownership of Learning
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How can teachers introduce activities designed to enhance the ability and motivation of students to express themselves in writing? We have a history of both in and out of the classroom writing experiences going back to the early 80’s. Our presentation will describe the process of designing materials and leading discussions that enhance the student cognitive process of written English competencies. We will use STEM context to illustrate the philosophy and processes applied to the design and implementation of writing activities.

Facilitating Student Writing
Larry Quinsland, Ph.D., Professor, Department of Science and Mathematics
David Templeton, Associate Professor, Department of Science and Mathematics

Time: 9:25-9:45 am
Place: SDC/1300

Poster Sessions — 12:30-1:30

Deaf and Hard of Hearing in Academia: Conversations about Career Pathways, Networking and Mentoring
Susan Foster, Ph.D., Professor, Master of Science in Secondary Education
Denise Kavin, Ed.D., Lecturer, Department of Liberal Studies

Abstract: Home to the National Technical Institute for the Deaf, RIT has more DHH faculty than any other mainstream university in the world. The social science component of AdvanceRIT capitalized on this diversity to explore the experiences of two underrepresented subgroups of women faculty - women of color (WoC), and deaf and hard of hearing (DHH) women.

In this poster session we share results from focus group interviews with DHH woman faculty. Topics covered include career pathways, mentoring and networking. Each topic will be described with examples from the interviews. The poster presenters will engage visitors in discussions about the results and areas for future study.

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Michael Kane, Lecturer, Department of Business Studies

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Emergent technologies now extend beyond peripherals, with machines penetrating our very flesh. Technology therefore is no longer conceptually delineated by terms such as “online” or “offline,” or “real” or “virtual.” With implanted technology, we begin to blur the lines between traditional Cartesian binaries of mind and body, machine and human, natural and artificial, ability and disability. Integration and embodiment such as this (as George Lakoff and Mark Johnson show), informs how we both organize and ingest information. We construct bodies of knowledge based on what we know of our own bodies; based on how we construct ourselves. With the marked increase of what some call “cyborg technologies,” questions of embodiment and attendant ethics must be addressed.

Cochlear implant (CI) technology is cited again and again as a novel form of post human embodiment, combining the biological and the technical. As such, cochlear implant (CI) technology may be generating new bodies of knowledge that are made manifest in cultural discourse. In order to further acknowledge and understand the diverse and evolving group that comprises cochlear implant users, we need to find out not only where and when a CI identity is being constructed and shaped by cultural discourse, but if so, how is it being constructed and how is it being received. The questions are these: how are people with CI presented in media, and how might these representations affect us as students, teachers, as intellectual, and as users of technology?

This presentation for ICED (part of an ongoing, larger project), begins to explore these questions. While the larger study is an analysis of what Brenda Bruegeman calls “implanting rhetoric” as it appears in a variety of cultural discourse media (in print, on film, in social media), the current study focuses specifically on representations of CI on television shows in the U.S. in the last half-decade and will display the findings of that analysis.

As technology becomes more and more “implanted” in our personal, professional, and academic lives, and in the lives of our students, rhetorical messages about CI and the ways in which they influence our perceptions and our identity formation will of necessity become vital areas of contention and exploration. Sooner or later, as educators, we will most likely have students in our classrooms who not only “interface” with technology, but who are actually, biologically integrated with technology. Some of us will be thus integrated, if we aren’t already. My study, as it examines media rhetoric and audience cultivation, serves as a starting point for further interrogation of the representation, reception, and internalization of CI in cultural discourse and its broader significance.

A Perverse Diverse: Dynamics of Attraction and Repulsion in Representations of Cochlear Implants in North American Media

Pamela J. Kincheloe, Ph.D., Associate Professor, Department of Liberal Studies

Have We Come a Long Way? Moving Disability into the Framework of the Diversity Model for Organizations and Career Development

Charlotte Thoms, Ed.D., Associate Professor, Department of Business Studies

Poster Sessions — 12:30-1:30

Desired Student Outcomes
There are many! Concept maps complement deaf and hard of hearing students’ visual learning styles; they appeal to our technology-savvy students. Synergy among students is noted in the classroom. Comparisons of completed maps ensure lively “what is an ideal concept map” discussions. All, with one exception, of the earned chapter test grades earned by the Accounting 3 students were either an “A” or a “B.” According to completed surveys, students want to adopt this approach for other classes! Ultimately, creating those maps give my students a sense of ownership with their learning process.
A Classroom-based Activity Designed to Enhance Student Comprehension of Enzyme Catalysis of Reaction Rate

Austin U. Gehret, Ph.D., Assistant Professor, Department of Science and Mathematics

Time: 8:35-8:55 am  Place: SDC/1310

The concept of enzyme-catalyzed reaction rate requires a foundational understanding of reaction rate to aid in the understanding of how enzymes influence those rates. It is predicted that the interchangeable use of these terms may diminish student understanding of these concepts. A classroom activity has been devised that allows students to visualize a reaction in both an un-catalyzed and enzyme-catalyzed setting. Students’ hands play the role of an enzyme by catalyzing the conversion of two pop beads linked together (substrate) into two individual pop beads (products) in the catalyzed setting. Students record the number of products they make over short periods of time, calculate the reaction rate at each interval and plot their progress on a graph. By comparing their progress to the same reaction occurring without the aid of a student’s hands (un-catalyzed setting), it is the intention that this role-playing exercise will allow students to better comprehend enzyme catalysis and its influence on reaction rate. Furthermore, this kinesletic approach allows to students to experience first-hand the effect substrate depletion has on enzyme-catalyzed reaction rate. Students should thus take away an appreciation for why the initial reaction rate of an enzyme is the best measure of its influence. Students are also asked to extrapolate on their experience to predict how temperature would influence their enzyme-catalyzed reaction rates. Survey results will reveal the effectiveness of this classroom activity towards improving student understanding of these fundamental concepts.

Evaluating Speech and Sign Recognition

Joseph Bochner, Ph.D., Professor and Chairperson, Department of Cultural and Creative Studies

Time: 8:35-8:55 am  Place: SDC/1310

The transmission of linguistic information is associated with communication and language development. The first part of this talk addresses the transmission of speech for purposes of communication in hard-of-hearing individuals. In particular, the measurement of speech recognition ability using a computer-based adaptive test will be described, and an overview of the results of past and current research findings will be provided. This test, known as the NTID Speech Recognition Test (NSRT), has been under development for a number of years, and it is currently available at http://apps.ntid.rit.edu/NSRT/. The second part of the talk addresses the transmission of sign for purposes of acquiring ASL as a second language. A novel approach to the measurement of sign recognition ability will be described. An overview of initial findings from two studies will be presented along with the next steps involved in the development of a computer-based adaptive test of ASL proficiency.

Early Communicative Stress is Gender-Specific and Linked to Adulthood Depression

Poorna Kushalnagar, Ph.D., Assistant Research Professor, Office of the President

STATEMENT OF THE PROBLEM: To describe the relationship between retrospective communicative stress and current depressive symptomatology in a sample of 143 DHH late adolescent and young adults in USA.

SUBJECTS: Following IRB approval by the local institution, 143 deaf and hard of hearing college students who were 18 or over were recruited and administered questionnaires related to language history and current psychological functioning. We included participants who have diagnoses of depression, anxiety and substance abuse.

PROCEDURE: Self-rating language proficiency, communication history, and Beck Depression Inventory-Short Form questionnaires were administered. Retrospective communicative stress is measured by questions that asked the participant to retrospectively report how much his/her mother and father understood what they said. Logistic regression models were used to estimate the likelihood of having depression that is associated with communicative stress history after controlling for gender, hearing level, and abuse history.

RESULTS: Approximately 27% of our study sample has a history of communicative stress where participants reported understanding some to little of what their mother or father said. In all models, significant odds ratio indicated that reports of communicative stress history increased the odds of depression symptomatology. There are gender-specific variations in the association between the individual’s gender and communication between DHH and students to experience first-hand the effect substrate depletion has on enzyme-catalyzed reaction rate. Students should thus take away an appreciation for why the initial reaction rate of an enzyme is the best measure of its influence. Students are also asked to extrapolate on their experience to predict how temperature would influence their enzyme-catalyzed reaction rates. Survey results will reveal the effectiveness of this classroom activity towards improving student understanding of these fundamental concepts.

CONCLUSIONS: Although our study findings suggest that DHH men and women with history of communicative stress are at risk for depression in adulthood, they do not provide information on the causal mechanisms linking communicative stress early in life and depression later in life. Greater attention should be given to promoting healthy communication between DHH girls and their mothers as well as DHH boys and their fathers, which might reduce the impact on later emergence of depression in the DHH individual.

Written with Sheila Bruce (NTID cross registered student), Tina Sutton, and Irene W. Leigh
Microsoft Office Specialist (MOS) Certification training program for deaf, hard-of-hearing and hearing university employees.  
Tracy Magin, Lecturer, Department of Business Studies  
E. William Clymer, Associate Professor, Department of Business Studies

The NTID Department of Business Studies offers an Administrative Support Technology (AST) program that prepares deaf students for a career in a variety of business settings including government, education, corporate and health care.

Students can prepare for the Microsoft Office Specialist program by enrolling in a full semester class, taught by experienced teachers of the deaf, in specially designed business labs that facilitate communication. Students can receive certification the current versions Microsoft Word, PowerPoint, Excel and Access.

Gmetrix online preparation software is used to guide students in practice. Certiport online testing system is used to administer nationally standardized assessment of skills. The NTID Department of Business Studies is an authorized training and testing center for these online services. Since 2008, 89 certificates have been awarded to 51 students, with 21 students receiving multiple certificates. The majority of certificates were for Word and PowerPoint. Students with MOS certification have a competitive advantage in the current job market.

Transition from student education to employee professional development. In fiscal year 2013, 27% of exempt staff and 18% of non-exempt staff are deaf or hard of hearing at NTID. There are 172 members of the faculty at NTID, with 34% being deaf and hard of hearing. Virtually all employees produce their own word processing, PowerPoint and spreadsheet files using Microsoft Office products. Yet many are not familiar with intermediate and advanced features of the Office suite of products. In an effort to contribute to professional development opportunities for RIT employees, the NTID Business Studies Department developed a plan where the expertise of the business faculty and the availability of specially designed computer labs and software, could be used to improve the skills of college’s workforce. A significant element of the plan was the availability of skilled instructors who are able to communicate directly with deaf and hard-of-hearing participants without the need for professional American Sign Language (ASL) interpreters. During June 2014, seventeen professional staff and one faculty member participated in weekend training and assessment sessions, focusing primarily on Word and PowerPoint. An additional one-week workshop was offered during July 2014, with 5 staff from the first group continuing their training along with two new participants. Certification results were documented for all 20 unique participants, with detailed feedback on the experience being recorded for 18 participants.

There were two deaf participants enrolled in workshops. Methods  Prior to acceptance to the MOS workshop, participants responded to a skills survey to ensure they were at an intermediate skill level for the application they have selected.

All communication during workshop activities was in simultaneous communication. During the first workshop meeting the features of the Gmetrix training system were demonstrated. When participants were ready for assessment, the Certiport assessment system was explained. A pre-test was available for each participant interested in knowing their current level of skill prior to training. After the initial orientation to the workshop, participants were able to work at their own pace. The instructor was available to respond to content and process questions.

Results  Of the twenty individuals enrolled in the workshops, 12 tested for certification, with 10 individuals passing. This represents an 84% success rate. 64% of participants attempted to complete two certifications during their one-week workshop, with no one being successful. The overall satisfaction and importance of the training was extremely high. 76% found the complexity of the skills needed to obtain MOS certification to be either somewhat or extremely complex.

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**Poster Sessions — 12:30-1:30**

Showcasing Student Learning using Portfolios and e-Portfolios

**Tracy Magin, Lecturer, Department of Business Studies**

**Kathleen Szczepanek, Senior Lecturer, Department of Business Studies**

**Mary Beth Parker, Associate Professor, Department of Business Studies**

**Adriana Kulakowski, Lecturer, Department of Business Studies**

Our poster session will display how portfolios and e-Portfolios are used in our Administrative Support Technology program to showcase student work. Students who use a portfolio during the interview process are able to show solid evidence of their skills and abilities.

Students in our program start developing a paper portfolio within their first year here. We then use our Business Graphics and Desktop Publishing courses to guide students through planning, creating, organizing and personalizing e-Portfolios by maximizing the tools available in Adobe Acrobat XI Pro.

E-Portfolios are an effective way to showcase student work and are easy to create.

Difficult. However, 88% of participants found the experience extremely beneficial and 88% also were very satisfied with the training experience for the 17 responses collected at the conclusion of training. 71% reported that the time invested in working towards the MOS certification was an extremely good use of time, and 88% indicated MOS certification is valuable to them. 82% strongly agree that they would recommend the training and certification to others within the university.

Future plans

The initial analysis of the MOS certification workshops has been extremely positive and a new series of workshops was scheduled for January 2015, though the results are yet to be analyzed. Expanded recruiting of non-exempt deaf and hard of hearing employees for future workshops is planned.
ADHD is associated with major mental health conditions, including anxiety and depression. Validly assessing ADHD in deaf adults, including college students, may provide a useful indicator of potential mental health concerns that could influence classroom performance and behavior, and career success. This and earlier studies focused on demonstrating that the Attention Deficit Scales for Adults: Sign Language Version (ADSA-SLV; Parasnis, Berent, Samar, Triolo, & Murphy, 2008, Rochester, NY: RIT) is a reliable and valid tool for assessing ADHD in deaf adults and that it is predictive of the presence of anxiety and depression in that population. The ADSA-SLV is a linguistically accessible ADHD self-rating test for deaf and hard-of-hearing adults. It offers ASL and English-based sign language with or without voice, and English print, meeting the heterogeneous language needs of the deaf community. It has 9 scales: Attention Focus/Concentration, Interpersonal, Behavior/Disorganized Activity, Coordination, Academic Theme, Emotive, Consistency/LongTerm, Childhood, and Negative Social. Parasnis and Samar (Association for Psychological Science Convention, 2013 May) reported excellent criterion validity (Deaf r=.90; Hearing r=.95; both corrected for attenuation due to imperfect reliability) and good sensitivity and specificity for the ADSA-SLV in comprehensive ADHD and mental health screening and diagnosis protocols for deaf adults. Evidence of ADHD in individual deaf college students in particular may be a marker for clinically significant anxiety and depression that could affect classroom performance and behavior, and career success in later life.

Assistant:
Amanda Lease & Marissa Polvere
Socioeconomic disadvantage increases children’s risk of exposure to various adverse events, such as complications of pregnancy, intrauterine illness, malnutrition, head injury, postnatal infections, etc. Exposure to such events impairs children’s physical growth as well as their neurocognitive growth, especially the growth of attentional self-control brain systems. Impaired neurocognitive growth may affect an individual’s performance and behavior in classroom and career later in adult life. Recent EEG studies of deaf and hearing adults (Samar, Segalowitz, & Desjardins, Association for Psychological Science 2013, 2014) show that adults from low childhood socioeconomic status backgrounds (low-CSES) have reduced activity in the attentional self-control network in the frontal lobes compared with adults from high-CSES backgrounds. Correlations between the strength of this EEG activity and body proportion data (leg and trunk length, BMI), collected from low-CSES deaf and hearing participants in these studies, are consistent with the interpretation that this reduced EEG activity may be specifically related to earlier childhood exposure to adverse events. This interpretation is plausible because such adverse childhood events (ACEs) are known to dysregulate both physical and neurocognitive growth pathways through complex epigenetic and metabolic reprogramming during childhood, possibly leading to deficits in attentional and behavioral self-control in adulthood similar to those caused by ADHD. However, our previous studies did not rule out the possibility that these body proportion alterations and the reduced EEG activity associated with low C-SSES may simply result from learned deficits in self-control due to the long-term psychosocial stresses of social disadvantage, rather than from physiologically programmed growth dysregulation triggered by ACEs. In the current study, we separately assessed participant’s childhood SES and their history of the presence of ACEs. We now report new brain wave and body measurement data to support the hypothesis that the reduced activation of the attentional control network associated with low CSES is specifically mediated by the presence of ACEs rather than the influence of socioeconomic class environment per se. Fifty deaf undergraduates reported parents’ education and occupation (SES proxies) and reported positive (ACE+) or negative (ACE-) histories from prenatal life to age 18 (15 ACE+ & 10 ACE- H-CSES participants; 10 ACE+ & 15 ACE- L-CSES participants). We measured leg length, trunk length, and BMI. We recorded 64-channel EEG in a visual behavioral-inhibition task that measured participants’ ability to inhibit pressing a button to certain stimuli. We isolated a brain wave component that measured activity in frontal-lobe self-control circuits. Comparing ACE+ and ACE- groups collapsed over CSES categories, the EEG activation was reduced for the ACE+ compared with the ACE- group (bootstrapped z’s>3.0, p’s<.0015). By contrast, L-CSES and H-CSES groups (collapsed over ACE categories) had statistically equivalent EEG activation levels. These results support our hypothesis that deaf and hearing young adults who experience adverse events prenatally or during childhood may develop physiologically programmed deficits in attentional self control that persist into adulthood. Childhood socioeconomic disadvantage may place deaf and hearing young adults at increased risk for poor performance in school and career due to the developmental consequences of their increased rates of exposure to adverse childhood events. Because adult attentional self-control deficits may be physiologically programmed by the occurrence of ACEs, affected individuals may require specialized evaluation and accommodation during adulthood.

Written with Sidney Segalowitz & James Desjardins