4th ANNUAL GRADUATE STUDENT EDUCATIONAL RESEARCH SYMPOSIUM

Wednesday / March 31, 2010, 1-5:30 pm / Purdue Memorial Union North Ballroom

Keynote by

RICHARD LESH
Rudy Distinguished Professor of Education in Learning Sciences, Indiana University
ABOUT THE SYMPOSIUM

Purdue University’s College of Education and the Graduate Students in Education Council (GSEC) is sponsoring the 4th Annual Graduate Student Educational Research Symposium, a research symposium for graduate students (and recent master’s and Ph.D. graduates) in education-related degree programs from across the Purdue campus.

SCHEDULE

1:15 P.M. OPENING REMARKS
1:30 P.M. POSTER SESSION I
2:30 P.M. BREAK (REFRESHMENTS SERVED)
3:00 P.M. POSTER SESSION II
4:00 P.M. BREAK (REFRESHMENTS SERVED)
4:30 P.M. KEYNOTE BY RICHARD LESH, RUDY DISTINGUISHED PROFESSOR OF EDUCATION IN LEARNING SCIENCES, INDIANA UNIVERSITY
5:15 P.M. AWARDS AND CLOSING REMARKS
ABOUT THE KEYNOTE SPEAKER

RICHARD LESH is currently the Rudy Distinguished Professor of Learning Sciences at Indiana University where he was the original Chair of Learning Sciences and Director of the Center for Research on Technology in Education. Formerly, he was the R. B. Kane Distinguished Professor of Education at Purdue University—where he also was the Dean for Research in Education, and Director of Purdue’s School Mathematics and Science Center. From 1989 to 1995, he was one of two Principal Scientists for Research at the Educational Testing Service in Princeton, where he was also the Director of the Center on Technology and Assessment; and, from 1971 to 1984, he was a Professor of Mathematics and Education at Northwestern University, where he also was the Dean for Research in Education from 1979 to 1984. From 1984 to 1999, he was the Director for Mathematics and Science Instruction at the World Institute for Computer Assisted Teaching (WICAT).

Since 1985, Professor Lesh has been the founding associate editor for Mathematical Thinking & Learning: An International Journal. In 1974, he chaired the task force that created the charter for the USA National Science Foundation’s first Program for Research on STEM Education. He was a founding member of the first Executive Committee for the professional organization Psychology of Mathematics Education (PME); and, he was the co-founder of the North American Branch of PME—as well as being the co-founder of the Research Pre Sessions associated with the National Council of Teachers of Mathematics (NCTM). His areas of specialization include research and assessment on problem solving, learning, and teaching in mathematics and science education—where he is especially known for his research on applied mathematics and science, and mathematical models and modeling.
SYMPOSIUM ORGANIZERS

NIELSEN PEREIRA, chair, is a doctoral candidate in gifted education with applied measurement and research methods as a secondary area of specialization. He has a master’s degree in applied linguistics and taught English as a second language in Brazil for 12 years before coming to Purdue. He has presented in state and national education conferences, including NAGC, AERA, AAAL and TESOL and has published in peer-reviewed journals in the United States and in Brazil. His research interests include identification and programming options for gifted English language learners, issues in language testing, and evaluation of gifted programs.

SAMIKSHA NEROORKAR, vice president, is a graduate student pursuing a Ph.D. in biology education research. She has a bachelor’s in both microbiology and education from India. She taught in an elementary school in India before she came to Purdue. She earned a master’s degree in education at Purdue. Her current work, in the area of biology education, is interdisciplinary in nature involving the college of science (biology department) and the college of education at Purdue. Her main interest is teacher education programs for in-service teachers and rural education in India. She presented at AGSERS last year. This year she will be presenting a project on the role of qualitative research in biology education programs at the Experimental Biology conference 2010.

GAURI KULKARNI, secretary is a graduate student pursuing her Ph.D. in the Department Of Special Education. She has a bachelor’s degree in psychology and a master’s in human development. She is interested in transition practices for students with high incidence disabilities and issues of cultural and linguistic diversity and special education teacher preparation. This is her third year to present a poster at AGSERS.
**MIRIAM BOESCH**, treasurer, is a doctoral candidate pursuing a Ph.D. in special education. She has a bachelor’s degree in speech-language pathology and a master’s degree in special education with an emphasis in augmentative and alternative communication. Her research interests include behavioral and communication interventions for children with autism and other developmental disabilities. Miriam also serves as the graduate student representative for the Council of Exceptional Children organization and is the treasurer of the Graduate Organization of Educational Studies. She has presented in numerous national and international conferences including the Council for Exceptional Children, the International Society for Augmentative and Alternative Communication, the American Speech-Language and Hearing Association, and the Association for Behavior Analysis International and has authored several publications.

**AYESHA SADAF**, marketing chair, is a doctoral student pursuing a Ph.D. in educational technology. She has a master’s degree in computer graphics technology. Her research interests include the areas of online learning, instructional strategies, and technology integration. She has served as the vice president Information services of the Purdue Association of Educational Technology. She has presented in numerous national and international conferences including American Educational Research Association, Association for Educational Communications and Technology annual conference, and Annual Sloan-C International Conference on Asynchronous Learning Networks.

**KIM DAVIS**, webmaster, is a Master’s student in educational technology. She has a B.S. in Computer Graphics Technology also from Purdue. Her research includes the use of Web 2.0 technologies in secondary and post-secondary classrooms.

We would like to thank the following AGSERS Committee Members: Daphne Duncan, Sara Flanagan, Rachelle Miller, Wylie Sirk, Yang Yang.
INNA ABRAMOVA
Immigrant Teachers’ Beliefs about Diversity
One of the prerequisites of students’ academic achievement is the development of cultural competence in children. Culturally competent teachers demonstrate an interest in students’ background and use it as the basis for teaching. Using the theoretical framework of cultural relevant pedagogy, this study examined perceptions of six immigrant teachers regarding the issue of diversity, and how these teachers believed their students’ cultures and languages had to be incorporated in the classroom. The teachers’ responses were analyzed based on their multicultural background and their current experiences with culturally and linguistically diverse students. This study yielded mixed results. Although all teachers in the study conceptualized diversity as an advantage of living in a multicultural society, their views on how to incorporate cross-cultural issues in the classroom varied. The major difference was related to the use of native languages in instruction. This study has implications for immigrant teachers’ professional development.

GENEVIEVE AGLAZOR
When did I become Black: Recent African immigrant student/teacher cultural connectedness and students’ self-concept
Globalization and demographic shifts in the United States has engendered wider acceptance of multicultural education resulting in more diversity in the student body. To serve this population, the education establishment broadened global competencies in preservice teacher education, particularly strategies for intercultural teaching. Research suggests that cultivating and nurturing positive student teacher relationships enhances students’ learning. However, studies also indicate that a primary reason why these relationships are difficult to maintain is a lack of understanding of cultural backgrounds, differing personal histories and experiences. The goal of this paper is to extend theories of Black identity construction into intercultural relationships between recent African immigrant students and their teachers. Where such relationships exist, they are devoid of the socio-cultural influences that support positive self-concept. Consequently, through the process of “erasure and abandonment”, these interactions lead to students’ self rejection and change in cultural profile with hopes of being accepted by the dominant culture.

ZAIRA R. ARVELO-ALICEA
Language Policies and English Education in Puerto Rico: A Historical and Political Perspective
The proposed project is a literature review that incorporates both qualitative and quantitative data sources to document the commencement and development of English education in Puerto Rico. Using a chronological approach, the influence of historical and political events on the design and implementation of language policies in this territory are presented. Some of the most salient political discourses and rhetorical connotations that evolved as a result of this complex interplay of language policies and historical events are introduced. These discourses are analyzed to illustrate the ‘reach’ of past and current educational practices on student achievement. A common thread is evident in the last century of English education in Puerto Rico. Under the leadership of both American and local functionaries, the territory has not achieved its main educational objective: the creation of a bilingual citizen.
LAURA BASSETTE
Reading with the dogs: The effects of a dog visitation program on elementary students with emotional and behavioral disabilities
This pilot study provided a preliminary systematic evaluation of a therapy dog reading visitation program on elementary aged children with emotional and behavioral disabilities. A multiple probe design across students was used to examine the effects of reading to a therapy dog on reading comprehension and on-task reading-aloud behaviors. During baseline and maintenance conditions, students were instructed to read aloud to themselves whereas during intervention, students were instructed to read aloud to a therapy dog. The intervention lasted for 3 weeks and three certified therapy dogs were used. Results indicated that while all three students experienced increases in on-task behaviors and maintained those behaviors over time, only marginal gains were made in reading comprehension and only two of the three students maintained the results. Suggestions for future systematic research are discussed.

KEVIN BERKOPES
MR. FIVE [Mathematical Reform from Interactive Video Experience]
Recently, teacher educators have begun the development of video cases embedded in hypermedia environments, which offer a quasi-field experience to prospective teachers. In this project, we examine the impact of a hypermedia-based video case system integrated in a elementary mathematics methods course for pre-service teachers (PST). Within this larger study, I examine the mathematical content knowledge of PST in reference to their abilities to distinguish between content, student knowledge, and pedagogical strategies. The data analyzed for this project draws upon pre-post data encompassing an assessment of PST’s mathematical knowledge for teaching and survey data drawn from both a video case observation and responses addressing content and pedagogical content knowledge. I will present findings on relationships between PST content knowledge and their ability to diverge the classroom experience into three distinct categories of content, pedagogical techniques, and student abilities.

HEATHER GRAMBERG CARMODY
Success as they see it: Successful African-American students in advanced mathematics classes
Despite years of research and policy revision, students from culturally diverse backgrounds are still underrepresented in advanced courses. Even when students are identified, a disproportionate number do not remain in accelerated courses. This is a qualitative study of factors contributing to the success of African American and multi-racial students in advanced mathematics classes. Specifically, what factors do these students and their parents identify that encourage continued engagement and success in advanced mathematics classes? In-depth interviews were done with several middle and high school students and their parents. The study is phenomenological in its goal of understanding the lived experience of the students. It is based on critical race theory with its consideration of power issues and inequality. Data analyses using open coding revealed several different findings, including the impact of high expectations, supportive adult involvement and quality education as factors in the retention of students in advanced classes.

ALLISON K. CHATTERJEE
Medical Students Show Limited Use of Computer-Aided Instruction in Studying Gross Anatomy
In the current study we assessed the use of computer-aided instruction (CAI) by gross anatomy students at the Indiana
University School of Medicine (IUSM) with a self-report survey (RR=51%). On average, 43% of students reported daily use of PowerPoint presentations, Internet browsing, and email. PowerPoint presentations and learning management systems such as Blackboard Vista were ranked ‘very useful’ by over 60% of students. Almost 60% of students reported that they never used CD/DVD-ROMs. A majority of students were either unaware of, or did not use any of the commercial computer applications that are currently available. Except at the IUSM-Lafayette campus, where almost half of the students reported using the Visible Human Dissector several times a week. Our study reveals that first-year medical students at IUSM make limited use of CAI to study gross anatomy. These results may be important in future decisions regarding the development of alternative learning resources.

SARA FLANAGAN
The Role of Technology in Two Secondary English/Language Arts Teachers’ Classrooms and Teaching Practices
This qualitative research study explored the role of technology in both classroom instruction and teaching practices in two secondary English/Language Arts teachers. Data collection occurred over the course of one semester through a series of classroom observations and interviews with both teachers. Results suggest that technology use in classroom practices and in planning for instruction are largely mitigated by a series of several factors. Factors may include teachers’ teaching experiences and experiences with technology, availability of technology, students’ responses to technology, and the teachers’ view of the role of technology in the classroom.

TATIANA GORIS
Misconceptions in Science and Technology
Learning a new material, students often carry many misconceptions about scientific concepts. Those misconceptions are also called alternative conceptions or pre-conceptions, which are robust, very resistant, and deeply rooted in everyday experience. To overcome existing misconceptions, some kind of conceptual change has to occur in the student’s mind. The purpose of this research study is to identify (1) the differences in misconceptions (about electronics) between freshman-level and senior-level engineering-major students. Stated another way, do misconceptions about electronics change during students’ progression from freshmen-level to senior-level? How strong is the correlation between students’ misconceptions about theoretical concepts (in electronics) and practical confusions and misunderstandings during lab-sessions, when students have to apply their procedural knowledge and practical skills?
Participants of the study are freshman-level and senior-level students from the ECET (Electrical and Computer Engineering Technology) department in the College of Technology.

11 MARISSA HARLE
Student Understanding of Proteins
Molecular representations such as protein molecules in biochemistry join theoretical constructs and experimental observations. The conceptual content of these visual representations is frequently very high, and understanding the interaction between the visual image and the conceptual knowledge it conveys is at the heart of chemistry. The meaning imparted by visual images allows chemists to have a common language for communication and inquiry. Research that has focused on visuospatial skills in chemistry has uncovered specific student difficulties in comprehending, interpreting, and translating molecular representations. This pilot project focuses on the student understanding of representations of proteins such as Jmol images found on Molecular Visualizations Resources website. Preliminary results will be discussed.

12 ANDREA JASPER
Assessing Educator Data: Which Method is Best?
Some teachers fail to see the importance of research because they feel it is not valuable or applicable to their students. However, federal legislation requires teachers to justify their instructional decisions regarding their students through the use of evidenced-based practices. This requirement emphasizes how imperative it is that teachers become familiar with effective methods of data collection. Effective data collection serves two purposes. First, it allows teachers to accurately record their students’ learning. Second, it allows teachers to accurately record the effectiveness of their own instruction.

The purposes of this study were to (1) examine how accurately teachers’ data described a student’s behavior and (2) to assess reliability among three different times at which data were collected. The results suggest that data collected immediately after a behavior occurred were more accurate and reliable than data collected at end of the day or the start of the following day.

13 FATIH KOCA
The Psychometric Properties of the Student-Teacher Relationship Scale in Turkish First-Grade Settings
We examine patterns of teacher-student relationships established during the first year of school in Turkish first grade contexts. Using a sample of urban public school Turkish children (N= 267) and teachers (N=15), we assess the psychometric characteristics of the Student-Teacher Relationship Scale (STRS; Pianta, 2001), a measure that has been widely used with Western samples. Specifically, we examine the: (1) dimensionality of the measure and provide initial evidence about the extent to which the STRS yields internally consistent scales that are comparable to those reported with western samples; (2) extent to which the addition of three culturally sensitive items to the STRS Dependency scale improves its psychometric qualities; (3) associations between teacher-rated school adjustment (behavior, social skills, and academic competence) and the teacher-child relationship quality. Exploratory factor analysis supported a three-dimensional structure (comprising Conflict, Closeness, and Dependency) for both the original 28- and the enhanced 31-item versions of the STRS. As hypothesized, there was no clear distinction between Closeness and Dependency. Children with high ratings on relational conflict with teachers were also perceived as more behaviorally deviant and less competent socially and academically.
**SHU-WEN LAM**  
**Layers of Complexity: Nouns in Fourth-Grade Science Textbooks**  
As K-12 students progress through the grades, they have a challenging task of understanding increasingly complex textbooks. This is especially difficult for students in the fourth grade, a critical point for literacy development (Allington, 2006; Carrasquillo, Kucer, and Abrams, 2004). Drawing on Systemic Functional Linguistics (SFL), the present study identifies the linguistic challenges of fourth-grade science textbooks. Interview data from one 4th grade teacher were utilized to locate challenging texts for fourth graders. The analysis reveals that technical terms and expanded nominal groups add layers of complexity on scientific definitions (e.g., Mass is the measure of the amount of matter in an object). Expanded nominal groups (e.g., the measure of the amount of matter in an object) through premodifiers (the) and postmodifiers (of the amount of matter in an object) pack more lexical content per sentence. Results identify potential linguistic challenges for fourth graders’ scientific literacy development.

**JIYEON LEE**  
**The Goal Oriented Motivational Instruction on Reading Comprehension of Students with ADHD and RD**  
Based on engagement perspective of reading development, in this study, we have selected motivational goal orientation to initially investigate in reading motivation. We recruited large samples (n=83) from 2nd to 5th grades students with reading problems, hyperactive/attention problems, combined group, and typical comparison from 3 elementary schools and randomized subjects to pretest-posttest control group design. The Gray Oral Reading Test (GORT-4) was used to measure reading comprehension and reading fluency. We hypothesized that there would be group differences in the effectiveness of the intervention (with goal-oriented motivational instructions) and a control condition without goals. Results indicated that there is a significant (p<.0001) group differences in reading outcomes by using motivational goal instruction.

**ROY B. MELTON**  
**Development of a Design Task to Assess Students’ Understanding of Human-Centered Design**  
Human-centered design has been shown to increase productivity, reduce errors, reduce training and support costs, improve people’s acceptance of new products, enhance companies’ reputations, increase user satisfaction and reduce development costs. We are creating a design task to assess students’ skills in doing, feelings toward, and knowledge about human-centered design. This assessment tool could be used not only by instructors, but also by researchers to plot out the turning points in students’ understanding of human-centered design over time. The assessment task is informed by findings from a phenomenographic study that identified and described dimensions of variation in students’ understanding of human-centered design as well as an extensive literature review and comparison of how design has been studied. We want our task to make it easily observable through verbal communication or artifacts how designers value the user as an inclusive partner throughout the design process.

**SAMIKSHA NEROORKAR**  
**A Teacher’s Viewpoint: The Influence of Images on Understanding of Biology Concepts**  
The organizations which direct science education in the USA, like the AAAS (American Association for the Advance-ment of Science) and the NRC (National Research Council) stress highly on the
importance of inquiry in science education. In this process of scientific inquiry, the teacher has an extremely crucial role to play. Analytical approaches to research in education describe teaching in terms of knowledge and knowing, beliefs about power and beliefs about restraint (Treagust et al., 1996). Science education in the USA places the teacher in a position to have power and exercise restraint. The teacher ultimately chooses what kind of materials to expose the students to. Two factors will aid this choice—what the teacher finds appealing and how the teacher perceives the students’ responding to the content. By examining the latter, this paper aims to guide teachers in the use of images, effectively in science learning.

HUI-HUA PAI
Motivation and Transfer
Preparing students for learning and problem-solving outside of classrooms is one of the important goals of schooling. This kind of adaptive ability to apply learning in novel contexts is referred to as transfer of learning. Many researchers have conducted studies on transfer over a century to understand this concept and its successful occurrence. Most of the research, however, has focused on its cognitive processes with considerably less attention being paid to motivation. The goal of this paper is to propose the potential influences of motivation on transfer by synthesizing the studies that examine the influences of motivation on cognitive processes related to transfer. Furthermore, a framework is provided and discussed to connect the relationship between transfer of learning and motivation.

SARA RANDRIANASOLO
Distinguishing Meaning within the Grey Areas of Immigration Regulations: A Semantic Analysis
The importance of immigration regulations is paramount in securing our nation’s borders and allowing the entry of qualified immigrants and non-immigrants alike who help the United States further enrich its portrayal as a cultural melting pot. Yet, the very laws that seek to govern these procedures are heaped with ambiguity. This lack of clarity has caused the regulations set forth in the Immigration and Nationality Act to be further espoused via interpretations from court decisions and explanatory statements in the Federal Register. Such loosely joined interpretations further muddle the meaning of immigration regulations, compelling individual institutions to become policy makers. This study exposes the existing loopholes as sources of ambiguity that cause practitioners to distinguish between subtle shades of meaning. For it is first the realization of these deficiencies and the recognized need for their revision that will lead to a future of clearly defined and unanimously accepted immigration regulations.

CHANELE ROBINSON
Preschool to Kindergarten: The Role of Preschool Social Competence in the Transition to Kindergarten
This study examines the association between preschoolers’ social competence and their adjustment to school in the beginning months of kindergarten. One hundred forty-eight low-income preschoolers that were followed into kindergarten participated in this study. During the spring of the preschool year, children’s social competence was assessed and rated by teachers. In the follow-up year, parents and teachers reported on the children’s transition and competencies were not related, teachers’ reports of the participants’ transition difficulties were related to teachers’ reports of the participants’
academic competence. Moreover, preschool social competence was negatively associated with kindergarten transition difficulties and positively associated with social competence in kindergarten. Implications of the findings and future directions are discussed.

ELOISA RODRIGUEZ
Perceptions of Curriculum in a grassroots community school in Honduras
The purpose of this research is to determine the impact of grassroots community schools in Honduran education by providing an in-depth analysis and description of a specific community school in the region. Findings will be based on interviews, observations and journals from people’s experience with this school and the Ministry of Education documentation on Honduran education. The sample includes 2 school administrators who founded the school, 2 teachers working at the school, 2 parents of the community, and 5 education students who have completed a field experience requirement at Esperanza School. Through a multicultural and cross-cultural narrative inquiry methodological framework, a deeper understanding of the ideological, cultural and educational experiences of creating a community school, working in one, and its impact will be presented. The picture that will emerge from this research will guide the educational entities in finding ways to make a difference in the Honduran educational system.

NAHYR ROVIRA-Figueroa, JESSICA WELLER, SARAH FREEMYER, FATMA YAMAN, MARISSA HARLE
Web 2.0 technology and representations of the particulate nature of matter
Research has shown that high school students have a variety of misconceptions about the particulate nature of matter. Chemists and chemistry teachers work with three levels of representations: the macroscopic level of experiments, the symbolic level of equations/symbols, and the molecular level of atoms, molecules, and ions. Chemistry experts have the ability to easily transform one level of representation into another, but novice learners do not easily develop this skill. Therefore, the goal of this project was to create a chemical reactions module that explicitly integrates the three levels of chemical representations. Standard software and Web 2.0 technology (e.g. YouTube, TeacherTube, Google Docs, Google Sites, and Google Forms) provided the framework to present these topics in an engaging and diverse manner. The development of the module and issues related to open-access, user-friendly interfaces, and online storage capability of student responses will be discussed.

TARIK SAADI
Citizenship Concepts among Moroccan Elementary Teachers
This pilot study examines six elementary teachers from Morocco. The study is primarily qualitative in nature, supported with quantitative-descriptive data, grounded in a combination of hermeneutics and phenomenology. The purpose of the study was to identify teachers’ perceptions of citizenship concepts. Other variables examined what teachers thought about the appropriate age and topics to teach citizenship in elementary schools. The outcomes of the interviews revealed the emerging concepts most recurring among teachers. While the goal of the study was not to measure the effectiveness and importance of citizenship education on students’ literacy skills, this was a variable that was discussed. This study also points to several shortcomings in the research that need to be analyzed and addressed in future studies.
JOEAN SHURR
Principal Preparation and Special Education Content: One State’s Interpretation of the ISLLC Standards
Public school principals are becoming increasingly more responsible for the management and outcomes of special education related services regarding both students and staff. This study presents a contrast between the preparation needs of principals with regards to special education content knowledge and one state’s approved university programs and ISLLC inspired school leadership standards. Despite the special education related issues within public school administration and an overarching emphasis of the standards on educating all students, findings in this study reveal a lack of special education related content in the state’s principal preparation programs.

ANGELA VAN BARNEVELD, MARY ANN REMNET, GENEVIEVE AGLAZOR
I’m not dead yet! Lived experiences of mature women returning to full-time graduate studies
The educational landscape is changing. In 1977, 24% of the doctoral degrees conferred in the United States were earned by women. In 2007, 50% of doctoral degrees conferred were earned women. Projections for the next ten years indicate that women will continue to surpass men in attainment of doctoral degrees. While demographic information is available through enrollment and statistical data, much less is known about the lived experiences of mature women as returning students. This study uses a heuristic analysis framework to explore the experiences of six women enrolled in full-time studies at the PhD level. The primary goal of this study is to add to the sparse literature on women’s lived experiences in higher education. Research outcomes may inform administrators and policy makers of the needs of this growing group of re-entry students, and influence program, resources, and funding decisions to support the changing landscape of higher education.

YANG YANG
Students’ Perceptions of Classroom Activities in China and the United States
Classroom activities are important to student learning and motivation at school. My Class Activities (MCA), an instrument for measuring elementary and middle school students’ perceptions of classroom challenge, choice, enjoyment and interest, was used in this cross-cultural study. This paper focuses on cross-cultural comparison, with detailed analyses that examine the differences between students’ perceptions in two cultures (China and the U.S.) by conducting factor analyses, multi-group confirmatory factor analyses, multivariate analyses of variance, and discriminant function analyses. Findings from the analyses are discussed with implications for practice and further research.

SO YOON YOON
Assessing Spatial Ability of Undergraduate Students who were placed in Gifted Programs and who were not
Spatial ability has been valued as a one-talent domain and as a type of assessment that is free from cultural, linguistic and social-economic status biases. Yet little is known about the spatial ability of students in gifted programs compared to those in general education. This study explored the spatial ability of 393 undergraduate students. A statistically significant difference was found between students by programs with a weak effect size (t(391)=2.339, p=0.02, Cohen’s d=0.25). A strong difference in spatial ability existed by the type of majors (STEM versus non-STEM majors) (F(1, 389)=30.50, p<0.001, partial η2=0.19) and gender (F(1, 389)=32.553, p<0.001, partial η2=0.20), respectively, in both programs with no interaction.
Comparisons by age, grade level, and race and ethnicity did not reveal any differences in spatial ability. The results are discussed as exploratory evidence in terms of identification procedures for gifted programs and the role of spatial ability in students’ choices of major by gender.

28 JI HYUN YU

Transforming students’ international experiences through the use of web 2.0 tools

An on-campus, international experience was integrated into a large introductory educational technology course, 335 students, divided into 41 teams, participated in a 5-week project in which they created wiki chapters about the educational uses of specific Web 2.0 tools. Two to four international students participated in each team, collaborating via the evolving wiki, as well as other Web 2.0 tools. Using t-tests and multiple regression, the authors examined changes in students’ confidence and perceived value on technology integration using these tools in future classrooms, as well as changes in global competency as social attitudes expressing relativistic appreciation of self and others, comfort with differences, and diversity of contact with others. Results showed significant changes in confidence and perceived value and global competency; diversity of contact that reflects behavioral components of a universal-diverse orientation, remained relatively unchanged from pre to post project. Qualitative results provide insights into instructional issues.
POSTER SESSION II

29 GENEVIEVE AGLAZOR
Cooperative Learning and Study Abroad: Multicultural Cooperative Learning by Immersion Model (McCLIM)

Very often the mere mention of multicultural education engenders the Black/White dichotomy. This paper presents a conceptual framework designed to harness ideological and theoretical elements in cooperative learning, submersion, and John Dewey’s Project-Based Learning (PBL) to enhance teaching and learning in multiculturalism. I contend that confounding the strengths in these pedagogical approaches and applying them to multiculturalism has the potential to create cognitive dissonance, intercultural exchange and understanding by way of experiential, hands-on collaborative learning among students. This understanding raises cultural awareness and sensitivity among students, and fills the cultural knowledge gap that exists between teachers and students as well as within multicultural education discourses.

30 RYAN ANGUS
Let’s get visual: the need for visual literacy in the primary science classroom

This paper examines and compares instructional characteristics of the language and images found in elementary science textbooks. Recent research has drawn attention to the significance of language in hindering or fostering understanding in science classrooms and textbooks. The language of science—full of specialized vocabulary and unfamiliar grammatical structures—is often a large obstacle for students to overcome. In addition to this language challenge, science textbooks are increasingly image laden. Because the assumption is often made that images are neutral in the way they present information, less attention has been paid to the impact of science textbook images in helping or hindering student understanding of science concepts. Using the multimodal discourse analysis framework developed by Kress and Van Leeuwen (1996), this paper presents a contrastive analysis of the image and text relationship in several elementary grade science textbooks in order to make recommendations for improving student comprehension of science content.

31 NICOLE BECKER
Student understanding of mathematics in physical chemistry

Upper-level undergraduate physical chemistry courses require students to be proficient in calculus in order to develop an understanding of thermodynamics concepts. Here we will present the findings of a pilot study that examines the relationship between math and chemistry in two undergraduate physical chemistry courses. Students participated in think-aloud interviews in which they responded to a set of questions involving mixed second partial derivatives with either abstract symbols or thermodynamic variables. Preliminary results of the study will be discussed.

32 MIRIAM BOESCH
Treating Self-injurious Behaviors in an Adolescent with Severe Autism

A single-subject research study using a changing-criterion design was conducted to evaluate the effectiveness of a treatment package in reducing self-injurious behaviors (SIB) that were escape and tangible-motivated. A treatment package consisting of delayed reinforcement and functional communication training (FCT) was implemented with a middle school-age student with autism and no functional speech who displayed SIB. The student was taught to use manual signs to request wrist-weights, a highly-preferred item. Because the wrist-weights were used as self-restraints and thus, prevented him from engaging in
many classroom activities; intervention also consisted of gradually eliminating the wrist-weights while increasing time on task. The primary goals of this study consisted of reducing the student’s dependency on the self-restraints and reducing SIB. Results indicated that the treatment package was effective in reducing SIB and wrist-weight dependency. Future research should concentrate on a more fine-grained intervention approach for multiply controlled behavior.

LIXIA CHENG

Fluency Measures and Task Variability

Task variability is both an important area of research in task-based language assessment and an essential line of inquiry for test developers and stakeholders. The purpose of the present study is to examine whether two tasks on a locally developed oral English proficiency test for international teaching assistants tend to elicit speech responses with significantly different fluency measures. Task responses of five proficiency and language background groups with 25 examinees in each (Chinese Score 3s, Chinese Score 4s, Chinese Score 5s, Hindi Score 5s, and Hindi Score 6s) were transcribed in a computer program named Praat, and the transcriptions were analyzed in terms of temporal measures and lexical variables. Statistical tests were performed to determine whether task has a main effect on the temporal and lexical variables, and whether task has significant interactions with proficiency level. Preliminary findings will be presented and implications will be discussed as well.

NICOLE COOK

Comparison of the Effects of Traditional and Electronic Labs on Student Learning in Science

This literature review compares the impact of traditional and electronic labs on student learning in science. For this presentation, traditional labs are defined as those in which students physically manipulate materials. In electronic labs students use computer simulations. Published research from science education journals on traditional and electronic labs has been examined to determine the impact of these approaches in isolation, in comparison to one another, and in conjunction with one another. Some findings include: 1) Traditional labs promote the proper use of lab equipment and may positively impact learning by affecting students’ attitudes; and 2) Electronic labs are reported to be less costly and can allow students to work in multiple modes. Findings regarding combination and comparison of the two lab approaches will be presented and implications discussed.

DAPHNE DUNCAN, OXANA KHARCHENKO, NICOLE WEBER

Student Perceptions of Engineering: Validation of a Coding Scheme

The Draw an Engineer Test (DAET) is a commonly used measure of students’ perceptions of engineering. Coding schemes that are currently in use rely on interview data to provide a complete representation of student perceptions, which can be time consuming and expensive. The purpose of this study is to validate a coding scheme developed by a team of researchers at the Institute for P-12 Engineering Research and Learning (INSPIRE) that will allow the coding scheme to be used as a stand-alone measure. This will be achieved by creating interview questions that directly compare to a system developed by INSPIRE to code student drawings. These questions will then be compared to elementary student / interview transcripts to see if the coding system can serve as a stand-alone measure of students’ perceptions of engineers and engineering. Once validated, the coding scheme will be utilized in program assessment.
DEBALINA DUTTA
Gender Differences in Thinking about Ethical, Experimental and Quantitative (TEEQ) Biology related to Functional Diversity of the Vasopressin and Oxytocin Receptor Superfamily
TEEQ Biology targets a large lecture course on organismal biology for biology majors. TEEQ engages students in reviewing scientific research by using the Calibrated Peer Review (CPR) program to structure writing assignments followed by anonymous peer- and self-review. For this study, evolutionary and functional diversity of the vasopressin/oxytocin receptor family was examined in vertebrates. For CPR assignment, students found another example of research where traits were used to hypothesize evolutionary relationships, and they evaluated a scientific conclusion suggesting a relationship tree. CPR assignments can be shared by faculty who want to interact with students in ways that lead to better engagement and retention of students in the major.

SUSAN GRAN
The Impact of a Science Methods Course on Elementary Preservice Teachers’ Conceptions of Inquiry
Inquiry and the National Science Education Standards (NRC, 2000) defines the aspects of teaching science through inquiry, and asserts that engaging in scientific inquiry is important for teachers to set the foundation for being able to understand how to facilitate inquiry-based science instruction in their own classrooms. Among the issues preservice teachers grapple with is low self-efficacy, less interest in science than other content areas, and understanding of science as inquiry. The purpose of this ongoing study is to determine preservice elementary teachers’ conceptions of inquiry-based science teaching as well as the effect of explicit instruction on inquiry methods on those conceptions. Data are being collected in the form of feedback forms, check-point reflections and student work. Preliminary data show that preservice teachers entering the science methods course have inadequate conceptions of inquiry-based teaching practices as well as low self-confidence in their abilities to teach science through inquiry.

MAURICIO A. HERRON
Preservice teachers’ personal epistemologies: Identifying differences and shared epistemological assumptions across and within domains
This study was designed to explore the beliefs about knowledge, science, and mathematics of a group of 16 preservice secondary teachers who were in their first week of enrollment in a teaching preparation program of mid-western university in the United States. Participants were selected using purposeful sampling. The data were collected using an online questionnaire composed of 20 open-ended items designed to reach five major dimensions of participants’ personal epistemologies: Nature of knowledge, certainty of knowledge, evaluation/revision of knowledge, process of knowing, and interaction between knowledge and society. Results showed that participants’ personal epistemologies share some general epistemological assumptions across domains. In addition, some participants seemed to embrace incompatible and even incommensurable epistemological assumptions simultaneously within some epistemological dimensions. We concluded that personal epistemologies may not be as stable as some researchers have suggested, and commented about important implications of these results for teaching preparation programs.
GAURI KULKARNI
Assistive Technology and Mathematics Education: Reports from the field
Mathematics is a critical content area and assistive technology can benefit students with high incidence disabilities in accessing and achieving in this domain. Yet, the field lacks awareness of how often teachers use assistive technology in mathematics and what types of technology they are using. This study sought to understand teachers’ self-reported use and perceived effectiveness of assistive technology in mathematics as well as factors hindering and encouraging the use of assistive technology in teaching mathematics to students with high incidence disabilities. Middle school special education teachers in two states were surveyed. Three main results were found: (1) relatively little technology is reported being used to teach mathematics to this population, (2) teachers generally perceived the technology for mathematics to be effective, and (3) teachers reported not being effectively prepared to teach with technology and felt knowledge and training served as both a barrier and a support to its implementation.

SENSEN LI
A Framework for Using Graphical Representations to Comprehend Students’ Engineering Thinking
Engineers and engineering students often face the challenge of comprehending complex systems because they are unsuccessful at recognizing major components in the system and the relationships between the components. Diagrams and sketches can facilitate their comprehension and communication of the complexity of a system. Their ability to construct and reason with these diagrams demonstrates their understanding of how to use the tools and their current conceptual understanding of the factors governing the behavior of that system. We are conducting a series of studies to better understand how students come to understand these tools better. This poster presents a theoretical framework for analyzing the interaction between knowledge associated with graphical representations to support thinking and the domain knowledge associated with using these tools to solve both routine problems and adapting one’s knowledge to generate new knowledge (innovation). We are using think-aloud protocols and observation of dyads working on problem-solving activities (design, troubleshooting or explanation) with these tools. We explore results from two pilot studies of students generating a House of Quality and functional block diagrams, which are both useful tools in making sense of a problem context. Participants constructed the diagrams as individuals or as part of a team. Specifically, results from these studies will inform the frameworks we are using to guide or interpret students’ learning progression and to design timely and meaningful formative feedback in the GRASP system. This NSF-funded project is called Graphical Representations to Assess System Performance (GRASP).

NATHAN MCNEILL
It’s just about the international experience: Identifying the outcomes of global engineering education experiences
Engineering educators recognize the global nature of the engineering profession and are looking for ways to help students develop specialized knowledge, skills, and attitudes so that they can become “global engineers” who are able to work effectively across cultures. As a result, many engineering schools have been developing globally oriented programs specifically for engineering students. There is, however, little research which evaluates the outcomes of these programs. A qualitative multiple case study was conducted to identify the outcomes of three globally oriented
programs for engineering students at Purdue. The findings of this study will help with the design and assessment of similar experiences and hopefully inspire the integration of global experiences throughout the engineering curriculum.

RACHELLE MILLER, NIELSEN PEREIRA, YANG YANG
Examining the Effects of Total School Cluster Grouping on Student Achievement, Identification, and Teaching Practices
Total School Cluster Grouping (TSCG) involves a whole-school approach to student placement and methods typically found in gifted education programs to improve the achievement of all elementary children. TSCG focuses on helping educators enhance students’ strengths, skills, and confidence by using achievement grouping and enriched instruction. Two rural Midwestern elementary schools comprised the sample of this study. Extant achievement scores were analyzed using growth curve models, and identification categories were examined to determine how TSCG affected student achievement. Qualitative interview data were analyzed to explore teachers’ perceptions of this model. Results showed improvement in achievement scores, increased numbers of children identified as high achieving, and positive teacher perceptions.

AYESHA SADAF
Critical thinking in online discussions: Role of initial question prompts
The current study examined how the verbal structure of initial question prompts influenced the levels of critical thinking in online discussions. Discussion questions collected from 8 different courses across four different disciplines were classified into nine question types: Playground, brainstorm, focal, general invitation, lower-level divergent, analytical convergent, multiple consistent, shotgun, and critical incident. A multiple case study framework was used to investigate the levels of critical thinking and was assessed using the theoretical model of practical inquiry. Using a quantitative content analysis approach, transcripts of 27 discussion postings were placed within one of the four cognitive-processing categories of the model. Results and implications for the contributions made by the verbal structure of questions that foster critical thinking in online discussions are discussed.

RYAN SHELLEY
Cyber-enabled infrastructures and the role of video-based learning instruments in teacher professional development
Cyber-enabled learning communities can enhance teacher professional development (TPD) while upholding to certain pre-established TPD qualities of merit. However, introducing this type of knowledge management system presents certain sustainability challenges, including but not limited to: maintaining the motivation levels of teachers to participate and actively contribute to the needs of others. The purpose of this study is to evaluate the effectiveness of video-based learning tools on TPD within the field of engineering education for elementary school students. Analyses will be performed by reviewing video footage from teachers participating in TPD studies and results will include discussion on the aforementioned challenges of sustaining elementary engineering curricula and standards. Although the findings are applied to teachers within the field of engineering, the aspects of creating sustainable teacher networks that induce self learning are equally relevant to the broader education community.
SARANYA SRINIVASAN
Secondary Effects of Antiepileptic Drugs in Children and Implications on AAC Processes: A best-evidence synthesis
This best-evidence synthesis investigates the secondary effects of various antiepileptic drugs (AEDs) and their implications on augmentative and alternative communication (AAC) processes (includes cognition, motor and behavior). Epilepsy is a serious neurological disorder, concomitant in individuals with developmental and intellectual disabilities who often need intervention because of little or no functional speech. The treatment modality is the use of AEDs, which are associated with debilitating adverse effects. This best-evidence synthesis approach incorporates the best features of a meta-analysis and retains insightful features indigenous to traditional systematic reviews. The literature search resulted in 37 articles based on a priori inclusion criteria. Effect sizes were used to characterize quantitative outcomes using a meta-analysis. Based on the level of evidence, individual studies typical of good quality are narratively synthesized. Results have shown several secondary effects that impair learning and performance. Evidence based implications for better interventions, assessments and teacher training have been detailed.

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BURAK TURKMAN
An Individualized Creative-Curriculum Approach
The goal of this study is to examine the effectiveness of an individualized creative-curriculum model called Eternal, on students’ academic motivation and their achievement-goal orientations. Participants are from in regular-classroom settings, full-time self-contained classrooms, magnet schools, and resource rooms. Regardless of where those students get their education, they first need a creatively and an appropriately designed differentiated curriculum that addresses students’ developmental, socioemotional, psychological, and academic needs. This study will be conducted in two elementary schools of the Lafayette School Corporation and all fifth grade students and teachers in these schools will be the participants. An experimental design will be applied only to the treatment group which is School X. One way analyses of variance (ANOVA) and T-tests will be conducted to understand the effectiveness of the Eternal curriculum on students’ academic motivation and academic achievement.

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ADHD and Mathematical Difficulties
Attention-deficit hyperactivity disorder (ADHD) is the most common childhood psychiatric disorder, with an estimated 3%-5% of all school-aged children, or approximately two million children having the disorder (APA, 2000; Barkley, 2006). ADHD is characterized by hyperactivity, inattention, and impulsivity (DSM-IV-TR, 2000). Children with ADHD have a greater rate of academic underachievement than their non-disabled peers (Barry, Lyman, and Grofer Klinger, 2002). It is estimated that 15% and 30% of students with ADHD have an underlying mathematical disability (Barkley, 1998). This poster addresses the impairments associated with ADHD, how they contribute to deficits in mathematics, and research-based interventions to improve mathematics achievement.

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ANGELA VAN BARNEVELD
Synthesis of Meta-analysis: The Contribution of Qualitative Methodologies
The often proclaimed “gold standard” for evidence in educational research is either randomized trial studies or meta-analyses. Between 1993 and 2005, several meta-analyses were conducted to determine the effectiveness of problem-based learning versus traditional classroom
instruction. All the studies used primary studies in medical education and, despite similar research questions, populations, and analysis strategies, the studies returned inconsistent results. In this study, an innovative qualitative synthesis methodology, meta-synthesis of meta-analyses, was utilized and modified to determine why mixed results were found. Substantive outcomes revealed differences in PBL effectiveness compared to traditional instruction. Process outcomes demonstrated a clear role and purpose for qualitative research, applying it to “second level” or meta-studies of quantitative research. Presented in this poster is a proposed staged spiral model that moves beyond the presumed endpoint of quantitative research synthesis and, instead, suggests a way for each methodological framework to inform the next iteration of research.

**YOGESH VELANKAR**

**Team dynamics in engineering design**

Recent national and international reports advocate teamwork as a desirable attribute for engineering graduates in the 21st century. How can academicians foster this skill in their students? This study investigates engineering students’ team dynamics in a design-based curriculum. Specifically we are interested in understanding students’ decision making processes and use of tools as they work in teams to solve design challenges. Furthermore, we are also investigating best practices to support the development of a virtual world as a platform for teamwork and collaboration to solve engineering design problems. In this poster, we present our literature review and research design to investigate these issues.

**JESSICA WELLER, JEREMY GARRITANO**

**Learning to Teach and Teaching to Learn: Redesigning a Chemical Information Literacy Course**

In order to receive an American Chemistry Society approved degree, chemistry majors at Purdue must take a 1 credit hour course called Chemical Literature. Our action research study focused on the structure and teaching of this course. Specific action strategies we took for this research included designing activities that engaged students with chemical information resources; designing student feedback forms; holding weekly debriefing sessions in which we reflected on the day’s lesson; and keeping reflective journals. Data analyses from our first semester of study indicated that our course should include more hands-on activities for the students. For the second iteration of our course we have designed and implemented purposeful activities for the students. Results from the second round of student feedback forms will be discussed and our action strategies will be evaluated.

**JIYOUNG YI**

**Impact of Authentic English Picture Books on ELL Students’ Motivation**

Language instructional materials that contain target-language-based authentic pictures have been found to increase motivation for language learners, yet there is little research that investigates the role of authentic images for ELL students. This study looks at the impact that culturally authentic images have on ELL students’ English reading activities. Condition one contained slides with American authentic images, condition two contained identical slides with “Koreanized” images, and the third condition provided the same with no images. Participants completed reading activities followed by
a written assessment. After the experiment, they also took part in a survey and an interview. The results show that target language-based authentic pictures played a significant role for ELL students’ motivation in reading particularly in terms of self-efficacy and goal achievement based on Conley and Karabenick’s (2006) three approaches to the study of motivation: personal interest, goal achievement, and self-efficacy.

52 SO YOON YOON
A Meta-analysis of the Gender Difference in Mental Rotation Ability: A Consideration of Testing Conditions
The Purdue Spatial Visualization Tests: Visualization of Rotations (PSVT:R) is an instrument to measure an individual’s three-dimensional mental rotation ability and has been frequently used in STEM research and education for more than three decades. A meta-analysis was conducted to quantitatively integrate 54 effect sizes of gender differences in the mental rotation ability obtained from 35 studies in which the variants of the PSVT:R are used. Results indicate that males tend to outperform females on the test. The weighted average of Cohen’s $d$ among 54 effect sizes is 0.63. Although we found a significant variation in effect sizes across studies, the variation is not explained by the conditions under which the test was administered. Therefore, the difference in the magnitude of gender differences across studies is not simply due to measurement errors. Possible causes of the gender differences and the variation in the effect sizes should be investigated in future studies.

53 YING ZHANG
Making Sense of Science Discourse: A Multimodal Approach for ELLs
This proposed project uses qualitative research methods to analyze four sixth grade English Language Learners’ (ELLs) science learning experiences of one curriculum unit. The research questions are: (1) How do middle school ELLs and the science teacher use multiple modes to communicate? (2) How do ELLs create individualized senses of meaning in science classrooms when learning is examined through a multimodal lens? Data were collected through two school visits per week from January, 2010 to February, 2010. Data include video recordings of children’s classroom experiences, audio recordings of formal and informal interviews with the children and the teacher, field notes, photographs about children’s projects, notes, and classroom scenes, photocopies of children’s writing and textbook pages. The data analysis is still in process and preliminary results show that the teacher and the students involve different usages of modes in communication, which may cause difficulty in students’ learning.

NINGER ZHOU
Effect of interactive non-fiction storybook-reading on ESL children’s language and content knowledge development
Research examining the effect of storybook reading (Brabham, 2002; Meyer, 1994; Sonnenschein, 2002) indicates that this practice is indispensable in promoting children’s literacy development. Evidence also has shown that the interactive multimedia storybooks are beneficial for students’ language learning outcomes. Yet little research has been done on this aspect for ESL children. In this proposed experiment, the following research questions will be addressed: (1) Is interactive multimedia storybook reading influential in the ESL vocabulary acquisition for children? (2) What are the main factors that promote children’s vocabulary acquisition? Fifteen preschool children from ELL families, along with fifteen English native speakers as the comparison group, are to be selected and will receive different
treatments for a period of one month. Data will be gathered from the pretest on their literacy development level and the post assessments of receptive and expressive vocabulary tests. The effect of different interaction styles during storybook reading on the literacy development of ESL children is compared based on the results of their vocabulary acquisition.

JIABIN ZHU
Experiences of Graduate Teaching Assistants in Engineering Laboratories: Case Analysis Using the “How People Learn” Framework
Graduate teaching assistants (GTAs) have played important roles in assisting faculty members in undergraduate education, particularly in science and engineering laboratories. Their responsibilities include lecturing; helping with classroom organization; grading quizzes, homework, and exams; and holding office hours. The purpose of this study is to examine how GTAs demonstrate the four elements of the “How People Learn” (HPL) framework (i.e., knowledge-, learner-, assessment- and community-centeredness) within first-year engineering laboratories at Purdue University. In spring 2008, researchers conducted semi-structured interviews with five first-year engineering GTAs who were selected purposefully based upon their prior experiences as GTAs in engineering laboratories. Content analysis, informed by the four dimensions of the HPL framework, and case analyses, were the methodologies used to analyze the qualitative data. Findings from the analysis will provide HPL-based profiles of GTAs’ teaching and will inform future training of GTAs in engineering labs.