

COERC 2004

Proceedings of The Third Annual College of Education Research Conference

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Florida International University
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**Proceedings of
The Third Annual College of Education Research Conference**

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Acknowledgements

To all FIU Third Annual College of Education Research Conference Participants, Sponsors, and Guests:

The FIU College of Education Research Conference Steering Committee would like to thank the College of Education faculty and students for supporting the Third Annual COE Research Conference: Interculturalism, Interconnectedness, Inquiry, and Instructional Leadership.

Special thanks go to the Steering Committee members who worked hard at creating documents and procedures: Michelle Cleary, (Co-chair, Steering Committee and Chair, Review and Selection), Barry Greenberg (L. R. Gay Award), Tony Normore (Keynote), Laura E. Blitzer (Marketing), Sarah Nielson and Masha Plakhotnik (Proceedings Co-Editors), and to the rest of the committee who contributed insights, edited, reviewed proposals, and innumerable other tasks associated with such a large endeavor. The Steering Committee members are: Carlos Batist, Michelle Cleary, Laura E. Blitzer, Elizabeth Cramer, Lisbeth Dixon-Krauss, Greg K. Dubrow, Delia C. Garcia, Barry Greenberg, Sarah Nielson, Tony Normore, William M. Ritzi, and Maria V. Tester.

In their a second year of service on the Lorraine R. Gay Award for Excellence in Research/Scholarship Selection committee are: Dan Dustin, First Frost Professor, Parks and Recreation Management, Adriana McEachern, Associate Professor and Chair, Educational & Psychological Studies, and Barry Greenberg, Professor, Educational & Psychological Studies. We appreciate their expertise and the time they gave to select this year's award winners.

We are grateful to Mrs. Maria Tester, Office of Research and Grants, who facilitated the work of the Logistics Committee. We appreciate the hard work of the student members of the committee: Vannetta Bailey-Iddrisu, Doctoral Student, Adult Education and Human Resource Development, Jorge Casanas, graduate student, Health Occupation Education, Helena Coello, graduate student, Health Occupation Education,

We appreciate the efforts of the faculty who participated by registering to moderate sessions. This year's moderators are: Laura Blitzer, Elizabeth Cramer, Greg Dubrow, Dan Dustin, Jo Gallagher, Lynn Ilon, Byan Moseley, and Bruce Nissen,

We also wish to thank the Miami Herald and Barnes and Noble Book Store for their donations and support of the conference.

The Steering Committee is indebted to the Office of Research and Grants for their sponsorship and the invaluable assistance of Mrs. Maria Tester. We are pleased that Steve Fain, PDK and Delia Garcia, PLUS are helping to defray the cost of refreshments and materials for the conference.

Thank you all for making *Third Annual COE Research Conference* an event that we are proud of and deserving of our continued support.

Tonette S. Rocco, Assistant Professor, Adult Education and Human Resource Development, and Michelle A. Cleary, Assistant Professor, Athletic Training/Sport Sciences, Co-Chairs, COE Research Conference Steering Committee

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2002 Merrett Stierheim, Superintendent of Miami-Dade Public Schools & Frank Till, Superintendent of Broward County Public Schools

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Phi Delta Kappa International

FOR NEARLY A CENTURY Phi Delta Kappa International has played an influential role in education. Members and volunteer leaders embody the ideals of the profession and are united in the belief that education is essential to a free society. The association provides professional growth opportunities, fosters collegiality among its members, and offers many services to education and the larger community.

MISSION To promote high quality education, in particular publicly supported education, as essential to the development and maintenance of a democratic way of life. This mission is accomplished through leadership, research, and service in education.

BELIEFS We believe in publicly supported education. We believe that high quality education for all is essential to the development and maintenance of a democratic way of life. We believe in upholding the ethical ideals of leadership, research, and service. We believe that leadership should be nurtured and developed. We believe that a dynamic organization incorporates the needs of its members, is responsive to the environment and trends, and changes as needed. We believe that diversity strengthens our association.

The FIU Chapter of PDK meets approximately five times each academic year. The chapter sponsors members who participate in national conventions and offer members the opportunity to develop relationships with others committed to the advancement of education. The Chapter sponsors lectures from visiting scholars and support members who represent the Chapter at national meetings. In addition, the Chapter has the opportunity to sponsor students for scholarship assistance and recognition for quality research efforts. Finally, the FIU Chapter of Phi Delta Kappa recognizes professional and lay individuals who work to advance the cause of education.

For information about joining PDK contact Dr. Steve Fain at fains@fiu.edu

Professional Leaders in Urban Schools (PLUS) Project

The Professional Leaders in Urban Schools (PLUS) project is a federal grant in the College of Education, funded through the U.S. Department of Education, Office of English Language Acquisition. It provides tuition scholarships for teachers from the Miami-Dade County Public Schools (M-DCPS) to complete a Master's degree in Urban Education with a specialization in Multicultural/TESOL. The program develops the knowledge, skills and dispositions of educators to work with linguistically and culturally diverse students while preparing teachers to seek National Board for Professional Teaching Standards (NBPTS) certification.

For information about joining PLUS contact Dr. Delia Garcia at garcia@fiu.edu

Dr. George E. Dambach— Keynote Speaker
Vice President for Research, Florida International University

Dr. George E. Dambach received his Ph. D in Pharmacology at Ohio State University. His many accolades include a Postdoctoral fellowship in the Department of Internal Medicine, Philadelphia General Hospital, and another Postdoctoral fellowship in the Department of Pharmacology and the Institute for Neuroscience, at the University of Pennsylvania and a Pennsylvania Plan Scholar. He has been active in numerous executive and advisory service initiatives in Michigan including the Greater Detroit Area Health Council, Inc. Advisory Committee on Health Policy, Research and Education, the Scientific Advisory Committee of the Ralph C. Wilson Sr. and Ralph C. Wilson Jr. Medical Research Foundation, and involved in the Accreditation Review of Albert Einstein School of Medicine. He is a member of the Board and Executive Committee of the Karmanos Cancer Institute and the National Advisory Board of the Merrill Palmer Institute for Child and Family Development and served in a number of roles for the Michigan Heart Association.

Prior to his most recent assignment as Vice President for Research at Florida International University, Dr. Dambach held numerous faculty and administrative appointments. He served as Vice President for Research at Wayne State University for 5 years. During this period, he helped to reorganize and modernize Wayne's research administration and played a significant role in the growth of its institution's research expenditures which lead to improved national rankings in research yearly. Dr. Dambach held a number of posts in the School of Medicine at Wayne State University including associate professor in the Department of Pharmacology, Assistant Dean for Curricular Affairs, Assistant Dean for Research and Graduate Programs followed by Associate Dean for Research and Graduate Programs.

Dr. Dambach's current role involves providing leadership to facilitate our progress at Florida International University as a Carnegie-Research Extensive institution of higher education. Among his tasks is the development and implementation of a strategy to expand the capabilities of the Division of Sponsored Research and Training.

Panel discussion abstracts for "Ethical issues in conducting urban and international research"

Moderator: Judy Slater

Panelists: Barry Greenberg, Lynn Ilon, Robert Meyers, Greg Salters, and Joan Wynne

Ethics in Urban Research: A Tale of Three Cities

Barry Greenberg

Ethical principles underpinning the conduct of educational research are widely distributed through organizations such as the American Educational Research Association. The requirement of adherence to guidelines from Institutional Review Boards before research studies with human subjects may be initiated also reminds us of the importance of communicating honestly to study participants about potential risks and rewards of study participation as well as their role in each phase of our research.

This portion of the lunch hour panel will suggest, through reference to educational interventions in three cities, Chicago, New York and Miami, that the decision-making process is not always founded on ethical principles. Despite widespread agreement on ethical mandates, and on No Child Left Behind's requirements of interventions based on "scientific-research", two of three of these cities appear determined to ignore contrary research and move forward with their plans to retain significant numbers of children in grade, based largely on the results of high-stakes testing programs.

Major Ethical Issues in International Policy Work

Lynn Ilon

The major ethical issues faced by most people doing international policy work are:

1. The needs of the funder are not made explicit and are usually officially expressed as an interest in "helping" the receiver.
2. The political units that oversee this work have at least some stake in seeing their political influence and/or organizational structures continue and this need overshadows the explicit objectives of the work.
3. Funders often need to justify their expenditures based on what is generally viewed as "objective" data when, in fact, analysis is almost never objective. Also, quantitative analysis carries an aura of legitimacy and is often preferred with, in fact, the best analysis may be qualitative, document, historical, etc.
4. Researchers, whether from the local country or from other countries, have their own needs including, generally, a desire to get rehired in similar work. Thus, they often shy away from risky conclusions or from pointing out structural/political errors on the part of the funding agency.
5. Many researchers including expatriate and elites from the same country have little knowledge of factors underlying the behaviors of poorer informants. Thus, they are at risk of misinterpreting or misrepresenting the reality which they are supposed to reveal.

Codes of Professional Responsibility

Robert Meyers

In order to maintain ethical professionals, most disciplines expect members to adhere to two distinct codes of professional responsibility. Codes of ethics or codes of conduct that are aspirational in nature speak in very broad terms about behavior that is consistent with professional norms and values and usually excludes an enforcement component. Another set of standards frequently exists that spells out in precise terms conduct that is considered unethical, with a well-defined enforcement component, and can subject the violator to an array of sanctions. In addressing conflicts of interest that exist within the education profession and those involved in education research, it is important to distinguish the conflicts that are likely to be evaluated by utilizing the legalistic/compliance-based approach from those conflicts that are likely to be measured against an integrity-based standard.

Urban Research and Ethics

Greg Salters

Within qualitative research there is a concern about validity and reliability of observational data and the impact that the observer has on the situation (Patton, 2002). This concern is further understood when one considers the two opposing types of observation – overt versus covert. These terms as do many terms in research have many different meanings depending on the research subjects. Institutional Review Boards were instituted in large part due to unethical researchers. Further the individuals that were most often victimized by unethical researchers were children, the poor, people of color, the sick, people with little education, women and men incarcerated in prisons and asylums, and children in orphanages or state correctional schools (Patton, 2002). Many of these individuals would be stereotyped or defined as urban.

When researching these groups of individuals the researcher has numerous ethical hurdles and considerations. Low income/urban/marginalized individuals might view certain situations differently than the population used to develop the instruments used to evaluate them, thus invalidating the results of analysis (Kezar, 2004). Further, using these instruments might “silence voices” outside the majority voices. Some theorists understand the value of looking at the way marginalized individuals stories are disruptive to the norm.

Patton’s Ethical Issues Checklist includes informed consent, interviewer mental health, advice, and ethical versus legal (Patton, 2002). In order to adequately address these ethical issues the researcher should be familiar with the culture in which he or she will be researching. Failure to give voice to the urban culture or the researcher being culturally incompetent when conducting urban research is in and of itself unethical and causes the research to be tremendously flawed.

Gregory Salters is a Sgt. with the Ft. Lauderdale Police Department where he has been employed for eleven years. As a police officer he has served in various capacities including Internal Affairs. In addition to his law enforcement duties he is certified by the Florida Department of Law Enforcement to teach Ethics, Human Diversity and Report writing. This certification has allowed him to become an adjunct professor at Broward Community College and teach at it's Institute for Public Safety (Police Academy). His students include new police recruits and current law enforcement officers. He has also consulted with various law enforcement agencies regarding ethics, leadership/motivation and human diversity. In addition, while serving in Internal Affairs he had the opportunity to handle some allegations of racial profiling and other police misconduct, which tested the ethical fiber of the law enforcement officers and the agency.

The Power of Story

Joan Wynne

My early educational background was literature. So I'm wooed by the power of story. One of Barry Lopez's characters says, "Sometimes people need stories more than food to stay alive." I'm one of those people. Story is the food that keeps me intellectually and emotionally alive. For me, research is a story. Some researchers tell that story in numbers-----some tell it in narrative. Some believe numbers are sacrosanct; some believe narrative is; and still others believe nothing is. Regardless of the form, though, the research story comes from a human who goes into and out of her project with ethical biases. For, all researchers, being human, come to those studies with cultural presuppositions and delusions.

Today, because story is my bias, I want to address "Ethical Issues in Urban and International Research" within that narrative framework. In addition, I want, during this talk, to suggest the possibility that in urban education, we have been researching the wrong families and the wrong schools, and, that as researchers we may be asking the wrong questions.

The Lorraine R. Gay Award for Excellence in Research and Scholarship

Past Recipients:

The College of Education's First Annual Research Conference 2002
Lorraine Wasserman, Ed.D.
Educational Leadership and Policy Studies, Chair: Leonard Bliss

The College of Education's Second Annual Research Conference 2003
Sarah Nielsen, Ed.D.
Curriculum and Instruction, Chair: Linda Spears Bunton

The purpose of the award is to acknowledge, in the name of L. R. Gay, outstanding research scholarship on the part of students and their supporting faculty in the College of Education of FIU.

L. R. (Lorrie) Gay, the founding professor of educational research for the FIU College of Education, was dedicated to students, to the rigorous pursuit of educational excellence and to research scholarship. She chaired the first doctoral dissertation awarded in the College of Education. She published textbooks in educational research, tests and measurement and educational psychology. They were published as L.R. rather than Lorrie because the publisher felt a female author would not be as accepted as a male, so initials were used. The text, *Educational Research: Competencies for Analysis and Applications* (7th edition) became the best-selling book of its kind. Her publisher estimates that 1 out of every 2 students in the field has used this text.

The recipients of this award walk in the shadow of someone who cared for every student, and fought to make our course in educational research the best of its kind because she knew this was the way to best serve students. If you have taken the course you know what it requires and as you realize the skills you have attained through her efforts, you appreciate her efforts to this day, years after her passing.

It is anticipated that one award each will be presented annually to the student and faculty member whose research best exemplifies Lorrie's high standards. In the case of multiple authorship for the same paper, then multiple awards will be bestowed.

The awards are determined based upon reading the papers that have been accepted for presentation at the College of Education Annual Research Conference. Award decisions are determined by the judgment of the faculty members serving as the L. R. Gay Award sub-Committee of the COERC. Members of this sub-committee are to be selected by the COERC steering committee and serve three-year terms.

The current members of the L. R. Gay Award sub-committee are Professors Barry Greenberg, Daniel Dustin, and Adriana McEachern.

If you would like to make a donation in support of this award checks can be made out to the College of Education and mailed to the Dean's Office 11200 Tamiami Trail ZEB 320 Miami, FL 33199.

Section One:
College of Education Peer-Reviewed Papers
and Posters

Female Collegiate Volleyball Player with Celiac Disease: A Case Report

Lindsey E. Eberman, Michelle A. Cleary, Ron E. Zuri, and Gary Salvador
Florida International University, USA

Abstract: Estimates of one in every 200 to 400 individuals, including the athletic population, suffer from celiac disease. Elite athletes present a unique complication when implementing a gluten-free diet because of the need for a high energy fuel. Dietetic adjustments such as increasing the caloric content and frequency are necessary to meet energy needs of highly physically active individuals.

A National Collegiate Athletics Association (NCAA) Division I female volleyball player (height = 183 cm, weight = 81.0 kg) presented a unique case which initially mimicked the early stages of an eating disorder exacerbated by a significant increase in physical activity (preseason conditioning consisted of 11 days of three exercise sessions per day with one day of rest). The athlete was observed before, during, and after volleyball practice and competition and before, during and after meals. Under this superficial surveillance, her behavior supported the presumption of an eating disorder. The athlete was removed from volleyball activity once her condition began to affect her performance and her activities of daily living. The athlete had lost a considerable amount of body mass during the first 20 days of the season (-8.1 kg). This finding prompted the sports medicine staff to refer the athlete to the University Health Center for diagnostic testing. All initial blood tests were within normal limits; however, her weight at this time was 72.9 kg and she was 14.5% body fat, prompting referral to a gastroenterologist. After extensive gastroenterological testing, this female athlete was diagnosed with celiac disease, a condition primarily characterized by diarrhea and malabsorption (Pugh, 2000). This case report describes a differential diagnosis for athletes presenting with loss of body mass or decrease in body fat percentage. Increasing diagnoses of celiac disease appears to be occurring in the general population including the athletic population.

Background and Significance

Celiac disease, also known as gluten-sensitive enteropathy and celiac sprue, is a gastrointestinal condition affecting the small intestine. The disease causes chronic inflammation of the villi on the mucosal lining of the jejunum in the small intestine (Pugh, 2000). Characteristics specific to celiac disease include a mosaic pattern and scalloped folds in the lining of the small intestine, best identified with an endoscope. These mucosal characteristics as well as pallor and erythema with obviously visible blood vessels within the lumen of the small intestine are the best indicators to diagnosing celiac disease. The cause of histological changes in the small intestine is attributed to a hyper-sensitivity to gluten, an insoluble protein found in wheat, barley, and rye grains (Branski, 1998; Wardlaw, 1999). The disease is labeled “silent” or sub-clinical as cases often differ greatly between individuals and may go undiagnosed for years because the patient does not exhibit any outward signs or symptoms of the disease (Branski, 1998). Celiac disease may be exhibited by signs and symptoms of diarrhea, bloating, abdominal pain, weight loss, menstrual irregularities, fatigue, and weakness (Inman-Felton, 1999).

Celiac disease is fairly common and various etiological factors appear to contribute to its development. In North American and European populations, celiac disease is prevalent in one in 200 to 400 individuals (Branski, 1998; Inman-Felton, 1999); however, many individuals with subclinical celiac disease may not have been diagnosed. Celiac disease is often triggered by a

life altering event or extreme stress (Nelson, 2002). Undiagnosed celiac disease can lead to a variety of subsequent conditions (Branski, 1998; Edwards, 2003; Nelson, 2002; Storsrud, Hulthen, & Lenner, 2003). Calcium and vitamin D deficiencies are related to the malabsorption of nutrients. Osteoporosis can develop if a patient or a physician does not recognize the signs of celiac disease. In cases with concomitant dermatitis herpetiformis (a skin condition sometimes associated with the disease), chances of developing cancers, such as lymphoma and bowel adenocarcinoma may increase. Problematic conditions can occur when implementation of a gluten-free diet (GFD) is delayed and when celiac disease is either unidentified or untreated, it can be fatal.

Cultural and environmental factors may play a role in the prevalence and the course of celiac disease. The onset of the disease has been linked to geographic location because of varying diets among continents and cultures (Branski, 1998). Family history, thyroid disease, type I diabetes, irritable bowel syndrome, anemia, chronic diarrhea, chronic fatigue, unexplained weight loss, shorter stature, epilepsy, infertility, dermatitis herpetiformis, and Downs syndrome are risk factors of familial conditions indicative of celiac disease (Branski, 1998; Edwards, 2003; Inman-Felton, 1999; Nelson, 2002). Heredity is a strong risk factor in celiac disease; 10% of first-degree family members tend to pass celiac disease to their offspring (Branski, 1998). Anemia occurs in 50% of celiac disease patients (Nelson, 2002). A variety of indicators can assist in diagnosis of celiac disease, and identifying these indicators within the individual as a whole may assist clinicians in implementing serologic testing and endoscopic biopsies.

Treatment options for individuals diagnosed with celiac disease primarily include dietary changes with adjunctive pharmacological intervention. Corticosteroid drugs are not commonly used unless the situation is life-threatening (Branski, 1998). GFD, the most common prescription treatment, eliminates wheat, barley, and rye in the diet and substitutes potatoes, rice, and corn to compensate for energy losses. The key to a healthy GFD is identification of all gluten rich foods; however, dining out can complicate the process (Inman-Felton, 1999). Since effective treatment depends on maintenance of the GFD, dietitians suggest a visit with a nutritionist to gain knowledge about diet alterations. Consumption of any gluten can cause relapse to symptomatic status (Branski, 1998). Eliminating gluten from the diet can be beneficial within 3 to 6 days, but full histological restoration of the small intestine will not occur for about 6 months (Inman-Felton, 1999).

Methods

The participant was identified as a patient of the principal investigator while working as an athletic training clinical education student. A signed medical information release was obtained from the participant in accordance with Florida International University Institutional Review Board policies. Data were collected by searching the internet databases MEDLINE, PubMed, and FirstSearch with the following keywords: celiac disease, wheat allergy, sport nutrition, celiac sprue, and gluten-sensitive enteropathy. The patient's medical files, physician notes, and diagnostic testing reports were gathered from the gastroenterologist and the University Health Center. After gathering all the related data, the publications were analyzed and synthesized in relation to the patient's case.

Results

Initially, this athlete's condition was presented as an eating disorder and treated as such until further evidence was found to the contrary. Upon interview, the athlete's teammates reported a history of performance-enhancing drug use, specifically ephedrine (banned by the NCAA) while the volleyball coaches observed a decline in her athletic performance. To identify

eating disordered behavior, the coaching and sports medicine staffs strictly observed her behaviors before, during, and after practices, competitions, team meals, and during travel. The athlete was observed to be falling asleep at meals, in the team van or bus and prior to and during practices for which she was not participating.

The athlete was removed from volleyball practice for her own safety. She was confronted about her behavior by the staff Certified Athletic Trainer and the eating disorder liaison who was also a Certified Athletic Trainer with a specialization in health education and a research background in sports nutrition. After an intensive interview process, the staff members determined that the athlete was not presenting clinically relevant psychological symptoms of an eating disorder and the athlete was referred to the University Health Center for a physical evaluation. The University Health Center performed routine blood testing procedures and identified clinical abnormalities within her complete blood cell count. The low hemoglobin, hematocrit, mean corpuscular volume, mean corpuscular hemoglobin, and red blood cell distribution all indicated the possibility of anemia. In this athlete's case, no drastic change in blood count was observed; however, the increased platelet count observed during the second blood test indicated the possibility of cancer or blood disease and required further testing.

The referral to the gastroenterologist revealed that the diarrhea, weight loss, and laboratory findings were indicative of active celiac disease. The gastroenterologist finalized his diagnosis using the results of the diagnostic testing procedures. The duodenal biopsy revealed diffuse loss of villi, crypt hyperplasia, increased inflammatory cells in the lamina propria, and intraepithelial lymphocytes (Diagnostic Notes, 2002). The loss of villi decreases the surface area for absorption of nutrients. The crypt hyperplasia was representative of unidentifiable or insidious increases in cellular formation, but not an indication of a cancerous tumor. The presence of inflammatory cells and lymphocytes indicated an active immune system response in the mucosal membrane (Nelson, 2002; Pugh, 2000). The serologic testing revealed elevated anti-gliadin and endomysial antibodies. In addition, malabsorption had led to noticeable Vitamin K and B12 deficiencies in our athlete, all leading to the confirmation of the celiac disease diagnosis.

Discussion

Uniqueness of the Case

Clinical course. The signs and symptoms of celiac disease are often and easily confused, and a differential diagnosis without appropriate diagnostic tests is difficult. From an internal medicine perspective, celiac disease may appear similar to the course of anemia, Crohn's disease, and other food allergies. For the Certified Athletic Trainer, the outward signs of celiac disease, especially in an elite female athlete, can imitate those of an eating disorder. Initially, an eating disorder was suspected based upon the signs and symptoms in this case including rapid decrease in body mass, loss of appetite, diarrhea, vomiting, and malabsorption after meals. Sundgot-Borgen (2002) found that athletes were 10% more likely than the average population (3.2%) to participate in disordered eating and 20% of women were even more likely to have disordered eating than the 8% of men in the athletic population with disordered eating.

This student athlete began pre-season with high potential and was pressured by her coach and her teammates to improve her volleyball skills. Rumors of ergogenic aid use existed prior to the athlete reporting for her sophomore season with the team. The rumors were never validated as the athlete was not supplementing at the time of the blood tests. The athlete denied allegations of an eating disorder when approached by her teammates. With the increased incidence and risk of an elite female athlete developing an eating disorder, the early signs of her disease, and the

early psychosocial pattern of behavior, the differential diagnosis included anorexia athletica, bulimia, anorexia nervosa, and gastrointestinal dysfunction. It was the stress to perform at an elite level that was believed to trigger the adult-onset of celiac disease.

Dietary challenges. Many demands are placed on today's collegiate athlete. Stresses imposed by full or partial scholarships, academics, athletic and social demands, physical demands of the sport, and the challenges of living away from home affect every aspect of the daily life of the collegiate athlete. Daily stresses place an even greater emphasis on nutrition and diet concerns with 32% of young athletic adults between the ages of 22 and 29 reported to be selective in their diet choices (Clark, 1998). According to the American Academy of Sports Medicine, the American Dietetics Association, and the Dieticians of Canada, at times of high intensity exercise energy intake must meet or exceed energy output (Joint Position Statement, 2000). A low-energy diet can cause fatigue, muscle mass loss, menstrual irregularities, bone density loss, and increased risk of injury or illness (Joint Position Statement, 2000). Female athletes, compared to non-athletes, tend to intake energy primarily from carbohydrates and less from lipid sources (Cupisti, D'Alessandro, Castrogiovanni, Barale, & Morelli, 2002). Carbohydrates are an important source of energy especially during exercise. The recommended intake of carbohydrates is 6 to 10 g/kg of body weight, but this recommendation can be affected by energy output, sport, gender, and climate (Joint Position Statement, 2000). Often, breads, pasta, cereal, rice, and fruit are the common foods linked to carbohydrates; in addition, vegetables, milk, and yogurt are also good sources of carbohydrates (Vinci, 1998).

Effective treatment of celiac disease in an elite female athlete depends greatly on the transition to a GFD while maintaining a high-carbohydrate diet. A GFD eliminates the ingestion of wheat, barley, and rye, all of which are generally optimal carbohydrate sources. Typical carbohydrate sources on a GFD are rice, corn, maize, flax, quinoa, tapioca, potato, amaranth, nuts, and beans as dietary carbohydrate substitutions (Nelson, 2002). The challenge of a GFD for the average person is significant and most dietitians recommend a series of at least four nutritionist consultations (Inman-Felton, 1999). The most important consultation involves identifying all foods containing gluten. The literature is very clear about the need for an altered diet and that the patient must maintain the GFD for their entire life in order to avoid recurrence or exacerbating the disease.

The management of celiac disease for a 19 year-old female athlete presents additional challenges. Optimal performance is achieved by maintaining a good diet and providing enough carbohydrate fuel for energy. Following a GFD with an increased need for energy increases the difficulty of compliance for athletic patients. Dedication and self-control are very important in maintaining a lifelong GFD. The primary treatment for our athlete was prescription of a gluten-free diet and counseling concerning the implementation of a lifelong GFD. The athlete was unable to return to volleyball practice immediately, but as she learned to alter her diet to meet the demands of her daily activities and her athletic participation, she returned to play. To date, her athletic performance has improved and has even exceeded that of her pre-illness status.

Conclusions

The information gathered in this case report is important for athletic trainers who should be aware that the prevalence of celiac disease is higher than once thought. Clearly, a potential exists that athletes may be suffering from celiac disease and that its signs and symptoms are remarkably similar to those of eating disorders. It is imperative for Certified Athletic Trainers to be aware of the prevalence of celiac disease in order to make an appropriate differential diagnosis

and avoid misdiagnosis which can lead to death if this disease is not identified and properly treated.

References

- American College of Sports Medicine, the American Dietetic Association, and the Dietitians of Canada. (2000). Joint Position Statement: Nutrition and Athletic Performance. *Medicine and Science in Sports and Exercise*, 32, 2130-2145.
- Branski, D., & Troncone, R. (1998). Celiac disease: a reappraisal. *Journal of Pediatrics*, 133, 181-187.
- Clark, N. (1998). Nutrition support programs for young adult athletes. *International Journal of Sports Nutrition*, 8, 416-425.
- Cupisti, A., D'Alessandro, C., Castrogiovanni, S., Barale, A., & Morelli, E. (2002). Nutrition knowledge and dietary composition in Italian adolescent female athletes and non-athletes. *International Journal of Sport Nutrition and Exercise Metabolism*, 12, 207-219.
- Edwards, M. (2003). Living with coeliac disease: Treatment for gluten sensitivity can seem like a life-sentence. Marilyn Edwards explains how a sympathetic, well informed practice nurse can help patients cope with the disease. *Practice Nurse*, 25, 24-27.
- Inman-Felton, A. (1999). Overview of gluten-sensitive enteropathy (celiac sprue). *Journal of the American Dietetic Association*, 99, 352-362.
- Nelson, D. (2002). Gluten-sensitive enteropathy (celiac disease): More common than you think. *American Family Physician*, 66, 2259-2266.
- Pugh, M. (Ed.). (2000). *Stedman's Medical Dictionary*. Baltimore: Lippincott Williams & Wilkins, 511, 756, 963 & 1694.
- Storsrud S., Hulthen, L., & Lenner, R. (2003). Beneficial effects of oats in the gluten-free diet of adults with special reference to nutrient status, symptoms and subjective experiences. *British Journal of Nutrition*, 90, 101-107.
- Sundgot-Borgen, J. (2002). Weight and eating disorders in elite athletes. *Scandinavian Journal of Medicine and Sciences in Sport*, 12, 259-260.
- Vinci, D. (1998). Effective nutrition support programs for college athletes. *International Journal of Sport Nutrition*, 8, 308-320.
- Wardlaw, G. (1999). *Perspectives in Nutrition*. Boston: McGraw-Hill.

Class Size Reduction: A Significant Option for Improving Student Learning

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Abstract: Raising academic standards is a driving force behind public school initiatives. True educational reform requires a data-driven approach to choosing valid options for student improvement. We discuss current and continuing research that provides evidence that class size reduction, with related variables, is a significant option for improving student learning.

In the last few years, significant attention has been given to raising academic standards and the quality of our nation's educational system. Among a variety of strategies proposed is the campaign for class-size reduction. The goal of this federal initiative, the Class Size Reduction Program (as authorized under PL 106-554), is to help schools improve student achievement by reducing class size through the hiring of fully qualified teachers to ensure that class size – particularly in the early grades – is decreased to no more than 18 children per class. The purpose of this paper is to discuss current and continuing research that provides evidence that class size reduction can improve student learning.

Methods

A review of the literature was used to collect data for this manuscript. The data were extrapolated from on-line press releases, professional and academic journals, as well as pertinent web sites and newspaper articles significant to class size reduction. Once these data were collected, they were placed in categories for analysis. Each article was read, re-read and analyzed in order to create common themes and categories on class size reduction issues. The analysis was conducted by reading and re-reading the data, and cross-checking to keep track of common themes and patterns that emerged. The following conceptual organizers occurred as a direct result from the literature search: (a) adequate funding, (b) high quality teachers, (c) effects on reading and mathematics, (d) effects on general students' achievement.

Theoretical Perspective

According to the Association of Supervision and Curriculum Development (2003) and the National Education Association (1999), at least four conceptual organizers frame the issue of class size reduction. A primary issue of effective class size reduction is adequate funding. Secondly, many proponents and opponents on the national and international stage feel there must be an adequate number of qualified teachers. A third concern is whether it is essential to apply the reduction in certain subject areas only, such as reading and mathematics. The last concern has to do with whether merely reducing class size will assure improvements in student achievement.

Adequate Funding of Class Size Reduction

Funding is considered to be the overall determining factor that outweighs the influence of other options; however, few policy reports have sufficiently identified the specific area or areas of funding that make a difference (NEA, 1999). Is funding of facilities more important than funding for materials and ancillary equipment needs? Is funding for teacher salary increases able to ensure student success? Or, is funding teachers' professional development and training, in conjunction with class-size reduction, essential to the improvement of student standardized performance?

The state of Tennessee initiated its class size reduction project titled Student/Teacher Achievement Ratio (STAR). This longitudinal study has been considered the most premier experimental research effort addressing the issue and cost the state approximately \$12 million dollars. The major results of the study were: (a) kindergarteners showed definite advantage for small class in achievement but no significant advantage for the use of a teacher aide; (b) first grade small classes outperformed students in regular classes on standardized tests; (c) second grade small classes had significant advantages in the SAT Reading, Math, Listening, and Word Skills; and (d) third grade small classes repeated the pattern regardless of attending classes in an urban, rural, inner city or suburban setting. In Florida, of the 840 million dollars allocated to the state for education, 464 million dollars have been estimated to lower class sizes.

Although there is little agreement as to the best way to reduce class size, there is little argument that it is a costly endeavor. The funding essential to achieving the target outcome of higher student achievement will drive its overall implementation and eventual success. The reality of limited resources has been dealt with in the state of California during their initiation of the class size reduction initiative. Due to the success of STAR, California's class-size initiative was begun in 1996 when California had a \$12 billion budget surplus. Research on this program reflected an increase in students' SAT-9 scores every year CSR was implemented, and the average score of each succeeding cohort was higher than that of the previous. Although many variables were considered as difficult to control for, they concluded many gains were nevertheless attributed to CSR. Over \$1.5 billion dollars was spent in 2000-2001 for their effort.

A recent article by Gilman and Kiger (2003) assessed the background of a variety of class-size reduction initiatives in several states around the country and concluded that further research on how to reduce the economic impact but retain the benefits of class-size reduction is essential. For example, Indiana implemented its first K-3 class-size reduction initiative (Prime Time) during the 1984-1985 school year. Although financial limitations made it difficult to continue the program beyond three years, teachers were fairly satisfied with smaller classes and felt significant gains had been realized.

Adequate Number of Qualified Teachers

According to the literature (Education Week, 2001), a shortage of qualified teachers and adequate spacing in some states (i.e., California) have led to class size reduction becoming a failure. In response, the United States Congress provided funding from 1999 through 2002 to recruit, hire and train qualified teachers (Education Week, 2003; National PTA, 2003). The intention of this initiative was to ensure that every child received personal attention, had a solid foundation for learning and learned to read by the end of third grade. They believe that improving teacher quality and reducing class size are essential elements of effective school reform.

Project STAR's results were also supported by similar findings in other states, such as Wisconsin, where a Student Achievement Guarantee in Education (SAGE) Program was initiated (NEA, 2003). SAGE was also found to have helped lessen the achievement gap between White and African-American students. Wisconsin's SAGE program not only targeted a class size of 15, but included the offer of extended services via "community schools," a rigorous academic program, professional development to enhance teacher quality, and accountability measures (Wagner, 2001).

Effects of Class Size Reduction on Reading and Most Subjects Areas

Test results in the Walnut Creek School District in California showed significant improvement in student reading achievement as a result of ongoing student assessment and

instruction modification in smaller classes. Data from the same school district for students above grade four reflected flat test scores on the same standardized assessments (Impact CSR, 2003). This difference has implications for decision-makers considering reducing class size at the middle or secondary levels.

An international perspective on class-size reduction has also offered pros and cons to the issue. Whereas the results of a pilot project, initiated in 2000, in secondary schools in Edmonton, British Columbia demonstrated positive impressions, the findings from research conducted in Australia, Flemish Belgium and France suggest minimal effect in most subject areas (Wagner, 2001). Wagner's research further revealed that class size reduction was minimally significant for improving math performance of students in Canada, Germany, Iceland, South Korea, and Singapore.

Class Size Reduction and Student Achievement

A policy paper on class size reduction and student achievement drafted by the Public Policy Institute of California (2002) stated the benefits of CSR, in terms of higher student achievement, have proven more difficult to validly identify. This is due to problems in separating achievement from other intervening variables, such as teacher salaries, expanded and improved preschool, greater use of technology, or other instructional programs. Nevertheless, there is evidence that, controlling for changes in teacher quality (i.e., fully qualified as opposed to partially certified), smaller classes raised student achievement (more direct instruction/one-on-one) and the effects were larger in schools serving predominantly lower-income students (i.e., more effective instructional strategies, students are more alert and focused).

Lessons Learned

Results of the research of previous and existing programs have also presented some supplementary data that suggests a cautionary approach to reducing class size (ASCD, 2003). This data are referred to as lessons learned which might minimize errors in the implementation of future initiatives such as those recently voted for and passed in 2002 in many states, including the state of Florida.

Under the constitutional amendment, school districts in the State of Florida are required to reduce class size by two students each year until 2010 (*Miami Herald*, 2003). Class size targets for kindergarten through third, fourth through eighth, and secondary, are 18, 22, and 25, respectively. Although the governor of Florida is willing to dedicate \$628 million in the 2004 budget for smaller classes, he warned that responding to the new law will not be achieved without the possible expansion of private school vouchers, lifting restrictions on the number of charter schools, or redrawing attendance zones.

California's effort has been criticized and labeled as a near-textbook case of how not to reduce class size. For example, California did not institute a trial program to explore class-size reduction options. They also failed to provide adequate funding to pay for the initiative or define "small classes" within the same construct of other states. Programs to reduce class size require careful planning and sufficient consideration of existing strengths and weaknesses of a particular school system (Biddle & Berliner, 2002).

Conclusions and Implications for Policy

One could venture to say that a mere reduction in students would not assure the desired academic achievement expected if certain and appropriate resources do not follow. Effective application of any policy for class size reduction must factor in certain considerations. The expertise, professional background and quality of teachers have to be factored in although, due

to a critical shortage of teachers, the number of qualified teachers may be difficult to obtain. Another important consideration would be the need for supplemental resources, such as technological equipment and other educational materials.

The ability to control for many potential intervening variables also complicates the issue. It would seem appropriate that policymakers include in their discussions variables of ethnicity, income levels, amount of time allotted per school subject, and teaching strategies. Sufficient and efficient evaluation of the class size reduction data must also be well thought out. Due to funding limitations (e.g., Indiana's proposed 17-year longitudinal study of Prime Time was cancelled), more collaborative efforts among stakeholders must be considered.

Finally, as policy makers demand greater student achievement and school accountability, it would be advisable to consider funds for schools to enrich an entire school population and not benefit only a few. A better approach to class size reduction might include reducing class sizes in a subset of schools each year, starting with low performing schools serving high poverty populations. This may limit the early departure of teachers. Many teachers leave the profession within the first five years, and students with special needs seem to suffer the most no matter what alternative is chosen. Believing and hoping for a successful conclusion may be within reach. It is crucial that all constituents become more involved in discussions about issues such as class size reduction. Our students deserve nothing less.

References

- Association for Supervision and Curriculum Development (1998). *Reducing class size* [Electronic Version]. Retrieved June 11, 2003, from <http://www.ascd.org/readingroom/infobrief/9809.html>
- Biddle, J., & Berliner, D.C.(2002). What research says about small classes and their effects. *Policy Perspectives*, West Ed; San Francisco, CA.
- Education Week. (2003). *Class size*. Retrieved November 19, 2003, from <http://www.edweek.org/context/topics/issuespage.cfm?id=44>
- Gilman, D. A., & Kiger, S. (2003). Should we try to keep class sizes small? *Educational Leadership*, 60, 80-85.
- Hallifax, J. (2003). \$53.5 billion budget ready for vote today. *Miami Herald*. Retrieved June 18, 2003 from <http://www.miami.com/mld/Miamiherald/living/education/5949354.htm>
- Harrison, S. (2003). Senate plan drops Internet classes. *Miami Herald*. Retrieved June 18, 2003, from <http://www.miami.com/mld/miamiherald/living/education/5764819.htm>
- Impact of class size reduction: Summary of academic gains as a result of class size reduction* (2003). Retrieved November 20, 2003, from <http://www.wcsd.k12.ca.us/impactcsr.htm>
- Jacobson, L. (2001). Research: Sizing up small classes. *Education Week*, February, 2001.
- James, J (2003). Schools to receive a smaller increase. *Miami Herald*. Retrieved June 18, 2003, from <http://www.miami.com/mld/miamiherald/living/education/6039348.htm>
- National Education Association (1999). *Statement of Lynn Winters before the Senate Committee on Health, Education, Labor, and Pension on Class Size Reduction* [Electronic Version]. Retrieved June 11, 2003, from <http://www.ascd.org/readingroom/inforbrief/9809.html>
- National Parent Teacher Association (2003). *Class size reduction*. Retrieved November 20, 2003, <http://pta.org/ptawashington/issues/classsize.asp>

Research Brief Public Policy (2002). *Effects of CSR and teacher characteristics on student achievement*. Retrieved November 20, 2003, from http://ppic.org/content/pubs/RB_602CJRB.pdf

Wagner, K. (2001). Class size policy. *Education Analyst*, 4(2) Retrieved June 11, 2003, from http://www.sae.bc.ca/2001_424.html

The Impact of Quality Teachers on Student Achievement

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Abstract: Various research studies reveal that factors, such as teachers' cognitive ability, subject matter knowledge, knowledge of teaching and learning, licensure, and teaching behaviors in the classroom, are related to teacher quality and increased student achievement. Through a literature review these five major themes emerged that support the research that quality teachers do matter.

In our nations' schools today, teacher quality is a priority area in education policy. The Federal No Child Left Behind Act of 2001 requires that every state put a "highly qualified" teacher in every classroom. Title 1 of the Elementary and Secondary Education Act (U.S. Department of Education, Sec. 1119) defines a highly qualified teacher as a person who holds at least a Bachelor's degree, is fully licensed to teach based on state certification, and has demonstrated competence in each academic area in which the teacher teaches (U.S. Department of Education, Sec. 1119). To meet the "highly qualified" teachers challenge, the role of teacher quality and variables that influence student learning come to the forefront in current educational goals.

Theoretical Perspective

Contrary to the 1966 study by James Coleman, as cited in Whitehurst (2002), that suggested that differences in teachers did not matter, recent studies have shown that teacher quality is the single most important school-related factor in student achievement. In 1996, value added assessments were conducted by Sanders and Rivers (Coleman, as cited in Archer, 1999) to answer the question of whether teachers matter. Math teachers in grades 3, 4, and 5 in two urban school districts in Tennessee were examined to determine the average amount of academic growth of students in their classrooms. From this data, teachers were identified and grouped as being the most effective teachers, the top 20%, and the least effective teachers, the bottom 20%. The progress of these students assigned to these effective and least effective teachers were documented over a consecutive three year period. The results revealed that at the end of 5th grade, math students assigned to the high performing teachers scored in the 83rd percentile; students assigned to the low performing teachers scored in the 29th percentile (Whitehurst, 2002).

In 1997, a similar study related to long-term teacher effectiveness was conducted in Dallas, Texas. Researchers extended the study across a wide range of grades, used three different urban school districts and two different methods of determining teacher effectiveness, and yielded similar results, emphasizing the measurable difference that better teachers have on student performance (Bembry, Jordan, Gomez, Anderson, & Mendro, 1998). In effect, these findings differ from the research of James Coleman in the 1960s that was interpreted as such, "the general message taken from Coleman's findings is that socioeconomic status largely determines student achievement . . . and what schools do doesn't matter very much, because in the end poor kids learn very little and rich kids learn a lot" (Archer, 1999, p. 3). The results of these longitudinal studies show that teachers are an influential factor of student achievement, regardless of socioeconomic status and even school location. In other words, a student having an ineffective teacher several years in a row can be at an academic disadvantage, which affects

his/her progress for years; whereas, a student with a highly effective teacher can have positive gains in academic progress for years to come.

Various research studies (Blair 2000b; Darling-Hammond 2000; Hanushek 1971,) reveal that factors such as cognitive ability, subject matter knowledge, knowledge of teaching and learning, licensure, and teaching behaviors in the classroom are related to teacher quality and increased student achievement. The purpose of this paper is to identify the indicators of quality teachers and their impact on student achievement by conducting a literature review.

Method

A review of the literature was used to collect data. The sources of data collection included policy briefs, executive summaries, on-line press releases, professional and academic journals, as well as pertinent web sites. Once these data were collected, they were placed in categories for analysis. The analysis was conducted by reading and re-reading the data, and cross-checking to keep track of five common themes and patterns that emerged during the data collection, which include: (1) cognitive ability, (2) subject matter knowledge, (3) knowledge of teaching and learning, (4) licensure, and (5) teacher behavior and practices.

Results

Cognitive Ability

Research findings show a positive relationship between teacher cognitive ability and student achievement. A study by Hanushek (1971) presents an interesting view of teachers. In his model, the teacher characteristic that appears to contribute to increased student academic performance is a teacher's verbal ability. For both second and third grade teachers, the score on a verbal ability test plays two roles: first it is a measure of communicative ability; second, it can be taken as a quick measure of overall intelligence and ability. Thus, overall intelligence or general ability seems important regardless of formal training. There is more research that shows that teachers who have strong verbal ability or score high on verbal tests impact student achievement more than teachers with lower scores. For example, a study of Alabama schools found that teachers' ACT scores accounted for 15% of the predicted achievement of their students, more than double the effect of class size, two and one half times the effect of a teacher's possession of a master's degree and more than five times the effect of teacher experience (Rotherman & Mead, 2003). Greenwald, Hedges and Laine (1996) conducted a study to determine the effect of school resources on student achievement. They found a total of nine studies that analyzed the effects of teacher ability on student achievement. Findings revealed a positive relationship between the two attributes. These studies suggest that measures of cognitive and/or verbal ability are strong predictors of teacher quality.

Subject Matter Knowledge

Subject matter knowledge is another variable that is related to teacher effectiveness. In a major study conducted by Wenglinsky on the relationship between indicators of teacher quality and the performance of 8th graders, teacher educational backgrounds appear crucial to the student performance on the mathematics and science portions of the 1996 National Assessment of Educational Progress (Blair, 2000b). Upon examining approximately 15,000 scores of 8th grade students' math and science performances, students whose teachers had college majors or minors in either math or science scored 39% higher than those whose teachers lacked such preparation. In addition, Monk, as cited in Darling-Hammond (2000), using data on 2,829 students from the Longitudinal Study of American Youth, found that teachers' content preparation, as measured by coursework in the subject field, is positively related to student achievement in mathematics and science.

While these studies appear to support the relationship between subject matter and teacher effectiveness, other researchers as cited in Darling-Hammond (2000), find that the connection between the two variables have mixed results. Studies of teachers' scores on the subject matter tests of the National Teacher Examinations (NTE) have found no consistent relationship between this measure of subject matter knowledge and teacher performance as measured by student outcomes. Byrne (as cite in Darling Hammond, 2000) did thirty related studies between subject matter knowledge to student achievement. The results were mixed with 17 showing a positive relationship and 14 showing no relationship. Also, studies by Ashton and Crocker (1987) found only 5 out of 14 studies they reviewed to show a positive relationship between subject matter and teacher performance. Despite the mixed findings, it may be safe to conclude that teachers who hold college majors or minors in the subject area that they are teaching, especially in math and science, positively impact student learning in those subject areas.

Knowledge of Teaching and Learning

While the evidence that subject matter makes a difference is mixed, research shows that teacher education coursework has a positive effect on student achievement. A study was conducted on the teacher education program at Arkansas Tech University to determine the extent to which education and subject matter course work predicted the teaching performance of student teachers completing the program (Ferguson & Womack, 1993). Findings indicate that course work in teacher education makes a difference in teaching performance; education coursework is a more powerful predictor of teacher effectiveness than measures of expertise in content area subjects. Furthermore, Ashton and Crocker (1987) compared professional education and academic subject area coursework to determine whether there was a relationship between the two variables and teaching effectiveness. The findings revealed that there was a positive relationship in four out of seven studies when researchers related the number of credits in education coursework. In contrast, a positive relationship was found in only five out of fourteen studies when the number of college credits earned in a subject area compared with student performance in that area. Furthermore, teachers' professional knowledge and skills can be developed through professional development and in-service programs to achieve successful student outcomes (King & Newmann, 2000). For example, at Lewis Elementary School in Texas, professional development focused on teaching strategies to teachers in reading and math, strategies that the students can use themselves. Over a 4-year period, students' reading and math achievement improved dramatically across a range of social backgrounds (King & Newmann, 2000). Studies cited in Darling-Hammond (2000) find that teacher opportunities to participate in professional development in content specific areas linked to the curriculum made an impact on teaching and student achievement. Therefore, teacher preparation education coursework is beneficial and worthwhile in making an educational difference.

Licensure

In addition to a degree in the field to be taught, research finds that teacher licensure is the most consistent predictor of student achievement in reading and math (Darling-Hammond 2000). Current requirements for licensing vary from state to state but generally include measures of many variables, such as basic skills, general academic ability of teaching and learning, and some teaching experience. In the state of Florida, the minimum requirements for admissions to teacher education programs is a 2.5 grade point average on a 4.0 scale, a passing score (40%+) on SAT or ACT, or completion of the baccalaureate requirements at a regionally accredited college/university. In Florida, a passing score on three tests, Florida's Academic Skills Test, Florida Teacher Examination Certification Exam, and a subject area test for each area of

certification, is required for licensure. Over the past decade, states have taken steps to strengthen their licensure requirements which are now substantially stronger than they were 15 years ago (Darling-Hammond & Youngs, 2002). In addition, for the first time ever, the federal government has mandated that fully licensed teachers be in every classroom to teach all children because research has shown that teachers who are fully licensed are more effective than those who are not. According to Darling-Hammond and Youngs (2002), studies using national, state and other data have reported that significant connections exist between teacher education and certification measures and student performance levels. For example, Goldhaber and Brewer (as cited in Darling-Hammonds and Youngs, 2002) found a strong influence of the type of teacher certification a teacher holds as an important factor on student achievement. Certified teachers had more influence on student achievement, especially in mathematics and science, than the teachers holding bachelor's and master's degrees (2002). In addition, a study conducted by the United States National Board for Professional Teaching Standards examined 13 aspects of teaching practice, including teacher effects on student academic achievement, and provided the first research evidence that the day to day performance of nationally certified teachers is superior to that of colleagues without the credential. Teachers' effect on student achievement was measured by randomly selecting the work of 4 students for evaluation as well as randomly selecting 3 students to participate in an interview following a lesson (Darling-Hammond, 2000). The results provide evidence that teachers who are nationally certified are helping students learn more.

Teacher Behaviors and Practices

Research on teacher behaviors in the classroom demonstrated that effective teachers tend to be those who are able to use a variety of teaching strategies and demonstrate a flexible style rather than a single, rigid approach. Studies cited in Darling-Hammond (2000) suggest that it is the expertise of the teachers that make learning occur for students. In general, effective teachers are able to adjust their teaching style to fit the needs and style of different learners because they have a wide repertoire of approaches and strategies, such as direct teaching, modeling interactive teaching strategies, cooperative learning techniques, and experienced-based and skill-based approaches. As cited in Darling-Hammond (2000), other variables that have been found to be important are teacher clarity, enthusiasm, task-oriented behavior, and higher order thinking. In effect, high quality instruction depends on competence and attitudes of each individual teacher. In the report of the National Commission on Teaching and America's Future the standards and assessments that have emerged from the National Commission on Teaching and America's Future identify that an effective teacher should have an understanding of how students learn and develop, skills in using a range of strategies; sensitivity and effectiveness in working with students from diverse backgrounds, the ability to work well with parents and other teachers, and assessment expertise capable of discerning how well children are doing, what they are learning and what needs to be done next to move them along (Darling-Hammond, 1996). Therefore, the fact remains that teaching behaviors and practices facilitate student learning.

Conclusions and Implications for Practitioners and Policy Makers

Given the important findings of this research and the mandate from the federal government's "No Child Left Behind" act, education leaders, policymakers and educators need to invest in critical areas that impact the quality of teacher and the quality of teaching. While it is no secret that better teachers produce better learning, educational reform must work toward restructuring and reinventing teacher preparation and professional development by connecting clinical work in schools with knowledge about what works for teaching and subject-matter

knowledge. If we are going to hold students to standards, we need to be able to ensure that the teachers who work with them will also be able to teach to those standards. Thirdly, teachers do matter, and their cognitive ability and knowledge of the subject matter and of teaching and learning, licensure, and teaching behaviors in the classroom are related to teacher quality. Major changes in the areas of recruitment, preparation, licensing, teacher support and opportunities for professional growth need to occur in order for teaching to improve, thus inevitably and positively affecting the most important variable of all, the student.

References

- Archer, J. (1999). Sanders 101. *Education Week*, 18(34), 26-28. Retrieved November 16, 2003, from Academic Search Elite: <http://www.epnet.com/academic/asearchelite.asp>
- Ashton, P., & Crocker, L. (1987). Systematic study of planned variations: The essential focus of teacher education reform. *Journal of Teacher Education*, 38, 2-8.
- Bembry, K. L., Jordan, H. R., Gomez, E., Anderson, M. C., & Mendro, R. L. (1998). *Policy implications of long term teacher effects on student achievement*. Retrieved November 16, 2003, from http://dallasisd.org/depts/inst_research/aer98rm1.html
- Blair, J. (2000a). Certification found valid for teachers. *Education Week*, 20(8), 1. Retrieved November 16, 2003, from Academic Search Elite: <http://www.epnet.com/academic/asearchelite.asp>
- Blair, J. (2000b). ETS study links effective teaching methods to test-score gains. *Education Week*, 20(8), 24.
- Darling-Hammond, L. (1996). What matters most: A competent teacher for every child. *Phi Delta Kappan*, 78(3), 193-200.
- Darling-Hammond, L. (2000). Teacher quality and student achievement: A review of state policy evidence. *Education Policy Analysis Archives*, 8(1),
- Darling-Hammond, L., & Youngs, P. (2002). Defining "Highly qualified teachers": What does "Scientifically-based research" actually tell us? *Educational Researcher*, 31(9), 13-25.
- Ferguson, P., & Womack, S. T. (1993). The impact of subject matter and education coursework on teaching performance. *Journal of Teacher Education*, 44(1), 55-63.
- Greenwald, R., Hedges, L. V., & Laine, R. D. (1996). The effect of school resources on student achievement. *Review of Educational Research*, 66(3), 361-396.
- Hanushek, E. A. (1971). Teacher characteristics and gains in student achievement: Estimation using micro data. *The American Economic Review*, 61(2), 280-288.
- King, M. B., & Newmann, F. M. (2000). Will teacher learning advance school goals? *Phi Delta Kappan*, 81(8), 576-580.
- Rotherham, A. J., & Mead, S. (2003). Teacher quality: Beyond no child left behind. A response to Kaplan and Owings (2002). *NASSP Bulletin*, 87(635), 65-76.
- U.S. Department of Education, Office of Elementary and Secondary Education. (2002). *No Child Left Behind Act of 2001*. Washington, DC: Author.
- Whitehurst, G. J. (2002, June). *Raising student achievement: The evidence of high quality teaching*. Remarks presented at the Standards-based Teacher Education Project 2002 Summer Conference. Retrieved November 16, 2003 from: <http://www.c-b-e.org/pdf/STEP2002whitehurst.pdf>

When One Dimensional Models Fail: Complexifying Models of Knowledge Construction

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Abstract: One dimensional models of reflective practice do not incorporate spirituality and social responsibility. Theological reflection, a form of reflective practice, is contextualized by a vision of social responsibility and the use of spirituality. An alternative model of reflective practice is proposed for spirituality and socially responsive learning at work.

Human resource developers are seeking ways to integrate spirituality and social responsibility through knowledge construction processes (Dirkx, 1997; Hatcher, 2000). Current models of reflective practice do not respond sufficiently to learners' need for spiritual integration (English, Fenwick, & Parsons, 2003) or connection to social issues (Hayes & Wilson, 2000). Theological reflection, a form of reflective practice in ministry, provides a model of reflective practice which embeds the problem solving process in spiritual information and a vision of social responsibility. The purpose of this paper is to illustrate an alternative model of reflective practice embedded in a framework of social responsibility and spirituality.

Human Resource Development's Quest to Integrate Social Responsibility and Spirituality

The desire for spirituality and social responsibility in human resource development points toward the need to incorporate questions of social responsibility and holistic information into models of reflective practice. Socially responsible outcomes maybe evoked by asking "what type of world do we want?" Holistic sources of information are the types of data we use to make decisions. The data includes cognitive, affective, spiritual, political, and communal experiences. The desire to incorporate social responsibility and spirituality in human resource development theory and practice is evident in the plethora of literature addressing social responsibility and spirituality.

The Academy for Human Resource Development sought to integrate learning, performance, and spirituality perspectives in a statement of purpose (Bates, Hatcher, Holton III, & Chalofsky, 2001). The underlying assumption of the purpose statement was that the integration of the three perspectives was desirable and could enhance the field. Spirituality was defined in the purpose statement as "human potential" or "the latent capabilities in humans for growth and development" (Bates, et al, 2001, symposium 9-1). Spiritual information may include meaning, practices, or rituals that express individuals' "awareness of something greater than ourselves" (English & Gillen, 2000, p. 1). Primary components of meaningful work include giving to others and bringing your whole self (mind, body, emotion, and spirit) to work (Chalofsky, 1997). The search for spirituality is connected to the search for social responsibility through awareness of human interconnectedness (English et al., 2003).

Models for performance improvement are beginning to include socially responsive outcomes (Hatcher, 2000; Kaufman, 2000). "Performance therefore is defined as outcomes of a systematic approach to positive and desired changes in the individual, processes, organization, community, society, and the environment" (Hatcher, 2000, p. 19). The economic theory underlying human resource development is expanding from an exclusive focus on the financial

bottom line to include other indicators of success. These indicators include the impact on social communities and the environment. At the organizational level, models are available to support socially responsible performance (Kaufman, 2000). No models at the individual level are available to support socially responsible learning in the workplace. A model of reflective practice is needed that affirms the relationship between social responsibility and spirituality and integrates socially responsible learning and spirituality within the workplace.

Reflective Practice

Reflective practice grew out of the realization that technical rationality or the application of theory to practice was insufficient for the unique and surprising challenges faced by professionals (Schon, 1983, 1987). Professionals meet the challenges of new situations that go beyond the parameters of accepted theory by reflecting in action. Reflecting in action is the ability to think about what one is doing and to change one's actions simultaneously (Schon, 1983). The ability to reflect on and learn from professional activity to determine appropriate ways to behave in the future is the keystone idea of Schon's reflective practice model.

Reflective practice relies on the use of cognitive information to learn to deal with novel situations. Schon (1983) identifies four primary steps in reflective practice: reframing the problem, drawing on a repertoire or familiar exemplars, formulating a new hypothesis, and testing the hypothesis. The testing does not occur as a formal experiment but in the broad sense of confirming or refuting a hypothesis. Reflective practice is one dimensional in its exclusive use of cognitive information for the purpose of problem solving. The one dimensional model of reflective practice does not acknowledge a vision of social responsibility or spiritual information. Reflective practice needs further development to integrate spirituality and social responsibility. By examining theological reflection, a model of reflective practice used in ministry education, possibilities for further development emerge.

Theological Reflection

Theological reflection is a knowledge construction process that incorporates spirituality and social responsibility in Catholic graduate ministry education. Lee (1994) claimed that graduate education in ministry is the most progressive form of professional education. Theological reflection provides professional education with a model that incorporates questions about social responsibility and multiple sources of information. Theological reflection brings together theory, praxis, and technical or instrumental knowledge in response "to a major paradigm shift within Western culture" (Lee, 1994, p. 25). The shift in knowledge construction involves the move from seeking truth in right belief, *orthodoxy*, to finding truth in right action, *orthopraxy* (Lee, 1994). The focus in practical theology has moved from theory and metaphysics to *praxis* or informed action. Technical or instrumental knowledge serves praxis rather than merely being applied theory (Habermas, 1971/1973). Informed action is at the center of the learning endeavor rather than intellectual affirmations.

Theological reflection is a conversation between individual and communal experience and the wisdom of a religious tradition to seek a vision of social justice and meaning in life (Killen & de Beer, 1994). The tradition component provides inspiration for the vision of social responsibility; cultural information includes social analysis; personal experience incorporates cognitive, affective, and spiritual information (see Figure 1). In the Catholic tradition, using liberation theology, the Reign of God provides an image and metaphor for social justice. The search to resolve ministerial concerns is embedded in the conversation between tradition, cultural information, and personal experience.

For example, a minister is presented with the problem of the lack of participation of women in the church's pastoral board. Engaging the model of theological reflection, the minister attends to information from her own personal experience, cultural information, and information from the church tradition.

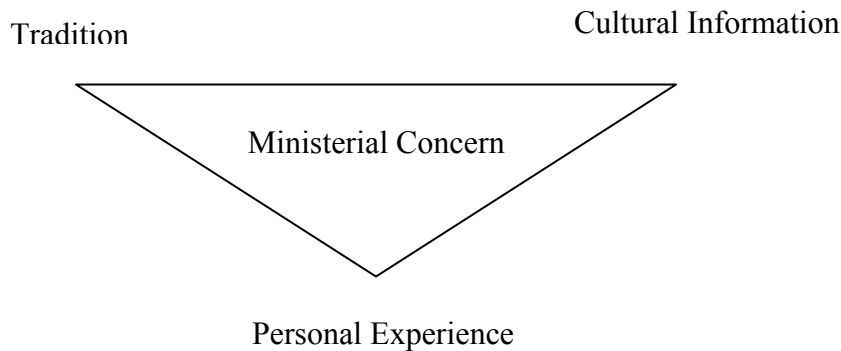


Figure 1.
Model of Theological Reflection (Whitehead & Whitehead, 1980, p. 14)

From her own experience, she may remember her own struggles with church hierarchy and feel anger and discouragement. She may also tell the story of her spiritual journey for strength and encouragement. A spiritual journey is evolution of the meaning, images, and feelings in the individual's relationship with the Ultimate over time. The cultural or social analysis reveals the historically submissive and private role women played in religion as well as successful strategies for empowerment and assertiveness. Analysis of the tradition may include reading scripture and feminist theologians that lift up positive models for women in church leadership. By attending to information in all three areas, personal, cultural, and tradition, the minister decides and implements an approach to affirm the leadership role of women in the church and secure their participation on the board.

The systematic construction of knowledge in theological reflection incorporates multiple sources of information (mental, emotional, social, and spiritual) (Killen & de Beer, 1994). In the example of the minister, spiritual information is elicited from the reflection on personal experience. Spiritual information may also include the influence of community worship and personal prayer and meditation on the minister's thinking. The analysis in the cultural and tradition areas reveals social injustice (i.e., history of women's oppression) and a vision of socially responsible outcomes (i.e., women in church leadership). Theological reflection brings together spirituality and social engagement in a transformative manner (Holland & Henriot, 2002). Theological reflection embodies the paradigm shift of knowledge construction and serves as model for reflective practice in human resource development by incorporating questions about social responsibility and multiple sources of information

Alternative Model of Reflective Practice

Imagine the effect of centralizing questions of social responsibility in the reflective practice of human resource developers. The questions of learning and performance will occur naturally within an explicit context of meaning, value, and vision. Answering the question of social responsibility requires diverse dimensions of knowledge. Cognitive, empirical

information is one source for constructing knowledge about our world. The yearning for spirituality tells us that it is not enough. We are feeling, imagining, symbolic, and communal beings who envision a world with all our senses and capacities. Constructing knowledge needs to include the full spectrum of cognitive, affective, biological, spiritual, political, and communal information to create socially responsible outcomes. By focusing only on the cognitive information and the problem, professionals can ignore the impact of the solution on society, the environment, relationships, feelings, and their spirit (Dirkx, 1997). Adding multiple sources of information in the service of socially responsible outcomes complexifies the models, processes, and experience of reflective practice. By embedding the problem within a vision of social responsibility and multiple sources of information, human resource developers may find satisfaction for spiritual and social justice yearnings (see Figure 2.).

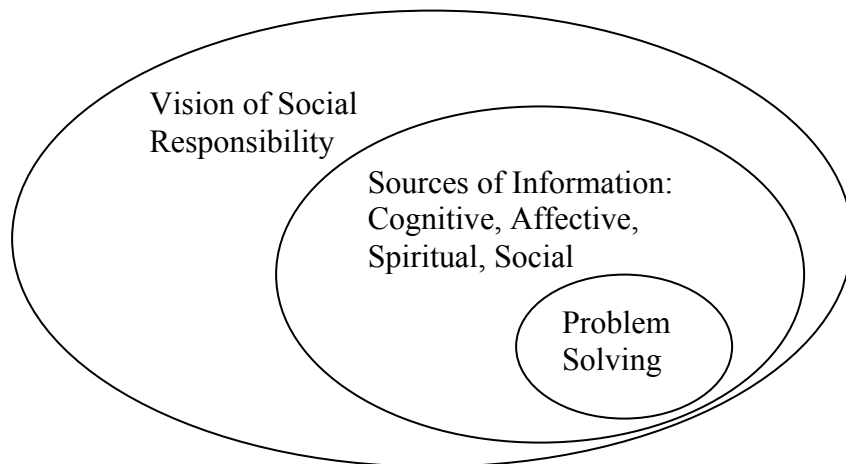


Figure 2.
Embedded Model of Reflective Practice

Figure 2 uses an embedded model rather than the triangulated model used in theological reflection to illustrate the relationships between the vision of social responsibility, sources of information, and problem solving. Embeddedness shows the enhanced context of problem solving activity – within a vision of social responsibility generated by responses to the questions of social justice and within data generated from multiple sources of information. The sources of information are embedded within the vision of social responsibility because the responses to the questions validate the sources used in solving the problem. If the vision is narrowly defined as profit, the social, affective, and spiritual experience of individuals is not valid or necessary. The cognitive and technical information will be sufficient to address the problem. For example, a manager in a computer store is faced with low customer satisfaction ratings and a decrease in sales. Using the traditional model of reflective practice, the manager will reframe the problem (e.g., employees are not trained properly), draw on repertoire of exemplars (e.g., identify successful training modules), formulate a new hypothesis (e.g., better trained employees will yield higher customer satisfaction ratings and increased sales), and test hypothesis (e.g., measure satisfaction ratings and profits after training). To solve this problem, the manager relied exclusively on cognitive information to increase the ratings and profit.

Using the embedded model of reflective practice, the manager begins to seek resolution to the problem of low customer satisfaction ratings and low profit by asking questions of social

responsibility in the outer circle. The questions of social responsibility may include: (a) What is a socially desirable outcome? (b) What is the desired quality of interaction for the customers and employees? and (c) What knowledge and skills are needed for life-affirming action? The answers to the questions may include the need to recycle computer parts, provide cultural sensitivity training for the multi-cultural customer base, and an expanded bottom line for the computer store. The answers paint a vision of social responsibility.

Within this vision, the manager seeks information from multiple sources. Using cognitive information (e.g., drawing on literature regarding customer satisfaction), affective information (e.g., asking how the employees feel about their relationships with customers), spiritual information (e.g., what meaning do his employees ascribe to their work and interactions and what does his own spiritual practice and tradition say about his work, relationships, and social responsibility), and social information (e.g. how is the overall work environment and mission contributing or inhibiting to the desired outcomes), the manager now has a very different context to address the problem of low customer satisfaction ratings and sales.

Using the vision generated by the questions of social responsibility and the data from cognitive, affective, and spiritual sources, the manager engages the problem. The manager may initiate a strategic planning process to redefine the mission and bottom line of the store. The manager may have discovered that the employees do not feel connected to the organizational mission and the spiritual meaning of their work. Using the information from the two outlying circles, Schon's (1983) four-steps of reflective practice may be engaged at this point or another problem solving technique. Resolving the problem in the embedded context results in a workshop for the employees to connect their personal and team experience with the transformed organizational mission. The embedded model of reflective practice generates multifaceted, spiritual, and socially responsive solutions to work problems.

Implications for Human Resource Development

The use of a complex model of reflective practice at work is important for human resource developers to create socially responsible work places and to engage multiple sources of information in knowledge construction processes. Encouraging professionals to define visions of socially responsible behavior and work is the first step in creating social justice. If professionals only seek to solve problems at the technical level, the social impact of their resolutions remains unexamined and potentially destructive to the social fabric. Professionals wield power and influence in Western society and if their power is not accountable to society, the potential for destroying the social and environment fabric is increased.

The proposed model of reflective practice challenges human resource developers to incorporate a holistic vision of the employee into the learning process. People at work are whole beings with cognitive, affective, spiritual, and physical needs and experiences. A complex model of reflective practice affirms a holistic view of employees and validates the use of multiple sources of information in the learning process. Embedding reflection in action in a vision of social responsibility and spiritual information addresses the yearning for spirituality and social responsibility expressed by human resource developers.

References

Bates, R. A., Hatcher, T., Holton, E. F., III, & Chalofsky, N. (2001, March). *Redefining human resource development: An integration of the learning, performance, and spirituality of work perspectives*. Paper presented at the Academy of Human Resource Development Annual Conference, Tulsa, OK. (ERIC Document Reproduction Service No. ED453416)

- Chalofsky, N. (1997, March). *The meaning of the meaning of work: A literature review analysis*. Paper presented at the Academy of Human Resource Development Conference, Atlanta, GA.
- Dirkx, J. M. (1997). Nurturing soul in adult learning. *New directions for adult and continuing education, 74*, 79-88.
- English, L. M., Fenwick, T. J., & Parsons, J. (2003). *Spirituality of adult education and training*. Malabar, FL: Krieger Publishing.
- English, L. M., & Gillen, M. A. (Eds.). (2000). Addressing the spiritual dimensions of adult learning: What educators can do. *New Directions for Adult and Continuing Education*, No. 85. San Francisco: Jossey-Bass.
- Habermas, J. (1973). *Theory and practice* (J. Viertel, Trans.). Boston: Beacon. (Original work published 1971).
- Hatcher, T. G. (2000). The social responsibility performance outcomes model: Building socially responsible companies through performance improvement outcomes. *Performance Improvement, 39*, 18 -22.
- Hayes, E. R., & Wilson, A. L. (2000). Reflections on the field. In A.L. Wilson and E.R. Hayes (Eds). *Handbook of adult and continuing education* (pp. 660-676). San Francisco: Jossey-Bass.
- Holland, J., & Henriot, P. (2002). *Social analysis: Linking faith and justice* (3rd ed.). Maryknoll, NY: Orbis Books.
- Kaufman, R. (2000). *Megaplanning: Practical tools for organizational success*. Thousand Oaks: Sage.
- Killen, P. O., & de Beer, J. (1994). *The art of theological reflection*. New York: Crossroad.
- Lee, B. I. (1994). Practical theology: Its character and possible implications for higher education. *Current issues in catholic higher education, 14*, 25-36.
- Schon, D. A. (1983). *The reflective practitioner: How professionals think in action*. New York: Basic Books.
- Schon, D. A. (1987). *Educating the reflective practitioner: Toward a new design for teaching and learning in the professions*. San Francisco: Jossey-Bass.
- Whitehead, J. D., & Whitehead, E. E. (1980). *Method in ministry: Theological reflection and Christian ministry*. New York: Seabury Press.

Professional Ethics and Welfare Reform: The Importance of Ethical Competence

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Abstract: This paper explores the professional ethics of welfare reform providers and its influence in the achievement of welfare reform goals. Four themes address the professional ethics and ethical competence of welfare reform providers.

The Personal Responsibility and Work Opportunity Reconciliation Act (PRWORA) of 1996, known as the Welfare Reform Bill, was passed to eradicate the problems of poverty and welfare by transforming welfare recipients into a self-disciplined, self-directed, and self-sufficient workforce. The achievement of welfare reform goals depends on the competence, motivation, and commitment of professionals who come from diverse disciplines, have different practical experience, operate from different political and ideological standpoints, and make decisions using standards and methods defined by their professional groups. Welfare reform providers (policymakers, social workers, program planners, teachers, and employers) may work from contradictory and conflicting positions, rendering services based on unwarranted perceptions about people on welfare (Abramowitz, 1996). More often than not professionals from the service network view welfare recipients as deficient, dependent, unmotivated, and lacking moral worth. These stigmas are prevalent and powerful, although social welfare scholars and critical educators have repeatedly disproved them (Sidel, 1998). These stigmas bias providers' decisions and judgments and lead to the design and delivery of inadequate programs, which further stigmatize the program participants.

Research has found that administrative practices of welfare agencies define the services they provide which has powerful impacts on program outcomes (Anderson, 2001; Beckerman & Fontana, 2001; Brodtkin, 1997; Lipsky, 1980). The purpose of this paper is to explore the professional ethics of welfare reform providers as portrayed in the literature to understand its influence in the achievement of welfare reform goals. Professional ethics is used as a conceptual framework because (a) in the USA today, public needs are served by persons in professional roles (Josephson, 1998); (b) ethics shape and define the nature of professions (McDowell, 2000), (c) ethical bearing and integrity are the measure for professional credibility today (Bowman, 1998), and (d) there is a growing consensus that our society faces a crisis in professional ethics due to professionals' failure to deliver social services that protect social values (McDowell, 2000). The paper begins with a discussion of professional ethics, a description of the method used for reviewing the literature, followed by a discussion of four themes that emerged from the literature review. A conclusion and implications section ends the paper.

Professional Ethics

To discuss professional ethics, a definition of ethics, profession, and ethical competence is needed. Ethics is the study of human conduct in terms of what is right or wrong, what is worth doing, and what should not be done (Velazques, 2002). A profession is an occupation that regulates itself through systematic, formal training; requires technical and specialized knowledge and adoption of basic ethical values and duties; and has a service orientation (McDowell, 2000). The idea of profession implies both cultivation of a certain vocation and a cultivation of ethical competence in practicing that vocation. Ethical competence is the possession of appropriate

personal and professional values and the ability to apply them effectively in professional settings (Cheetham & Chivers, 1996). Some personal values are social sensitivity, tolerance and respect for others, and adherence to a personal moral code. Examples of professional values are adherence to professional codes, impartiality, and concern for the rights of the individual and the welfare of society.

Wilkins (1995) defines professional ethics as a term that employs three distinct but interconnected meanings. The most general understanding of the term refers to the ethics of all professions. Professions across disciplines share similar ethical standards and normative commitments such as wholeness of character, personal and professional integrity and honesty, support for others, and respect for democratic processes. The second meaning focuses on a particular profession and articulates the normative characteristics unique for that profession. The third meaning refers to the kind of ethics displayed by professionals and whether the stated purposes of a profession are served. Professional ethics refers to the values, responsibilities, duties, and obligations that ought to guide the conduct of professionals. Professionals are expected to act rationally to maintain a stable and equitable social order. Intentional or unintentional neglect of clients' rights, professional duties, and social responsibilities erodes public confidence, diminishes the common good, and undermines the foundations of a democratic society.

Method

To explore the professional ethics of welfare reform providers as portrayed in the literature, research was analyzed on welfare-to-work programs published in the proceedings of the Adult Education Research Conference (AERC) from 1997-2003. AERC was chosen because it reflects the changing emphasis and orientation of research in adult education and the growing diversity and maturity of the field. Boyatzis' (1998) inductive approach to interpreting qualitative data through thematic analysis was used. First, descriptors such as welfare, welfare reform, welfare-to-work, and public assistance were established. Second, the AERC online conference proceedings from 1997-2002 were searched year by year. The year 1997 was used as a starting point because it was assumed that welfare-to-work programs would be in place by this time since the PRWORA was passed in 1996. Each descriptor was inserted separately into the category search string to accomplish the search. To ensure that all relevant articles were located each title and abstract were searched for each descriptor. The proceedings from the year 2003 were hand searched because these proceedings were not yet available on line. Seventeen articles contained the descriptors. All articles found were qualitative studies on predominantly black welfare women. These articles were read and categorized according to the major topic of the article. Data were analyzed searching for themes that implied encroachment of professional ethics or provided evidence for exemplary professional behavior. A theme was defined as a pattern found in the information that at a minimum describes and organizes the possible observations and at a maximum interprets aspects of the phenomenon (Boyatzis, 1998).

Article Review and Discussion

Four themes recurred from the review of the literature that address the professional ethics and ethical competence of welfare reform providers. The themes are patriarchal authority, political interests, stereotyping, and teachers' attitudes.

Patriarchal Authority

Patriarchal authority is the primary form of social oppression (Abramovitz, 1996) degrading women's unpaid labor in the home, devaluing women's care giving role, and forcing dependency on men or the government (Sparks, 1999a). Patriarchal authority undermines the

autonomy and freedom of welfare women by depriving them of their right to choose education and training that could help them move out of poverty (Hayes & Way, 1998; Sparks, 1999b, 2002). Patriarchal authority helps guarantee welfare women's inferior position in the economy and the society reserving the lowest paid jobs for them (Sparks, 1999b). Welfare women call this emotional and financial blackmail because they are forced to obey the welfare system to take care of their children.

Patriarchal authority is exercised when caseworkers interpret women's needs for them, conceal information on available options, and force women into programs that often do not prepare them for the jobs available in the local economies. Sparks (1999b) shares the story of a welfare woman who had called most of the medical clinics in the surrounding rural area and had found there was no demand for medical receptionists, yet she was ordered into a six month program by her caseworker only because that program had slots open. Caseworkers assert their authority with unfair sanctions such as taking away childcare vouchers, reducing amounts of food assistance, not returning calls, or conveying inaccurate information to employers (Andruske, 2000; Hayes & Way, 1998; Sandlin, 2001; Sparks, 2001). Instances in which caseworkers treat welfare women with empathy are rare. Such instances show that concern, consideration, and good communication ensure positive attitudes and helping relationships and play a significant role in the achievement of meaningful results.

Political Interests

Executors of welfare reform policy have differing political interests and educational orientations which lead to uneven policy implementation (Sparks, 2002). For instance, proponents of the "work-first" approach argue welfare women get hands-on training from working that is better than learning abstract concepts in training programs. The primary focus of the "work-first" approach is to place welfare women immediately to jobs, even if the jobs are low-skilled, provide little training and pay wages below the poverty level. The assumption is that through work, women will acquire basic abilities and knowledge that will enable them to move to more skilled jobs and highly paid positions (Hayes & Way, 2001).

Proponents of the human capital approach advocate education and training as the prospect of moving welfare women from poverty to economic self-sufficiency (Adams, 2002). But education for unskilled and low skilled welfare women is a complicated activity because a wide range of stakeholders are involved with providing the service (Sparks, 2002). Education for low skilled welfare women is often inadequate and low quality because of poorly designed fast-track training programs. Such education does not help welfare women move away from dependency and poverty but instead helps supply the market with cheap labor and helps maintain the gendered history of denying welfare women fair education and decent compensation.

Stereotyping

The success of welfare reform depends on the ability of welfare providers to place welfare clients into jobs leading to self-sufficiency and economic viability, to act in their favor, and to build rapport with them. However, welfare women are perceived as deficit-driven and as the single cause for their economic situation (Andruske, 2000; Sandlin 2002; Sparks, 1999b, 2002). The stereotypical portrayal is that women on welfare embody all negative American traits: laziness, dependence on government, wanton sexuality, imprudent reproduction, and lack of values which cultivate violence, school failure, out-of-wedlock births, and perpetuate poverty by passing it from generation to generation (Sidel, 1998).

Program planners, providers, and adult educators who are asked to design and deliver fast-track programs tend to consider the personal and emotional issues of welfare women as

impediments to the learning process (Sparks, 2002, Sandlin, 2002). Case managers and employers consistently report that welfare clients bring undesirable work habits to the work place because they have never worked and have never been in any kind of structured activity. Lack of skills, lack of punctuality, illiteracy, absenteeism, low motivation, bad attitudes, unreliability, and personal hygiene are problems (Sparks, 1999b). Employers screen and eliminate welfare women who are likely to be troublesome. Welfare providers enforce close oversight and strong sanctions to “shape” the behavior of welfare women. These practices limit opportunities for strengthening work skills and habits, for finding lasting employment, and disregard welfare women’s right of well being.

Teachers’ Attitudes

Teachers’ beliefs, relationships, and learning environments hold a key to successful or unsuccessful engagement and participation in welfare-to-work programs (Ziegler & Durant, 2001). Teachers, whose ideology is covertly racist and sexist, reinforce the stigma and help perpetuate mainstream stereotypes about welfare women (Sandlin, 2002). These teachers continually stress the idea that welfare women are dependent, unwilling to learn and work, have moral problems, and abuse the system (Andruske, 2003, Sandlin, 2001, Sparks, 2002).

Sandlin (2002) states it is disturbing that there are teachers who are operating within these prevalent myths instead of being advocates for welfare women. Teachers’ inability or unwillingness to acknowledge the worth of students leads to low motivation, diminished learning capacity, and discontent with learning activities.

Teachers, who want to make a difference in welfare women’s lives, persist in helping them achieve their goals and aspirations regardless of the obstacles and the unfriendly system they have to navigate. They treat participants with respect, appreciation, and lack of prejudice which fosters self-esteem and pride (Ziegler & Durant, 2001; Sparks, 2001). Trusting relationships are built through delegation of leadership roles, teamwork, and collaborative activities that develop a sense of group membership. Developing meaningful relationships through an ethic of care empowers welfare women to participate in learning activities and to take control of their lives.

Conclusion and Implications

Differing value systems, alternative courses of action, and conflicting obligations shape the practice and decision-making of welfare providers and generate either negative or positive consequences. Negative consequences result from a failure to adhere to standards of ethical competence and social obligations. The article review illustrates that breaches in professional ethics and professional responsibilities include failure to recognize welfare women’s rights to welfare, freedom, and the pursuit of happiness; failure to treat welfare women with respect and lack of prejudice; and failure to help welfare women realize their potential. Educators who believe education has the potential for achieving social change and that welfare women deserve respect and appreciation for their life journeys bring about positive consequences.

Welfare reform providers operate as parts of a larger endeavor, welfare reform, which aspires to eradicate the problems of poverty and welfare by transforming welfare recipients into a self-disciplined, self-directed, and self-sufficient workforce. Practices and decision-making geared towards positive consequences imply that social sensitivity, tolerance, and care have a strong influence in welfare reform context. To help cease the problem of social injustice and to advance welfare recipients’ educational attainment and independence, welfare reform providers should critically examine the contexts in which they operate by questioning their own

assumptions and privileges and by resisting stereotyping. Improvement of ethical competence and practice can be achieved through conversations among reflective practitioners on the ethical dimensions of their work and through self-education (Lawler, 2000). Awareness of why welfare reform providers make certain choices and what the consequences of these choices are for welfare clients may result in stronger commitment to ethical conduct and a more responsible and ethical practice.

References

- Abramovitz, M. (1996). *Regulating the lives of women*. Cambridge, MA: South End Press.
- Adams, J. (2002). Going to work: An examination of the meaning of work in welfare-to-work. *Journal of Vocational Education Research*, 27(2), 197-216. From <http://newfirstsearch.altip.oclc.org/WebZ>
- Anderson, S. (2001). Welfare recipient views about caseworker performance: Lessons for developing TANF case management practices. *Families in Society*, 82, 2, 165-175.
- Andruske, C. L. (2000). Self-directed learning as a political act; Learning projects of women on welfare. *Proceedings of the 41st Annual Adult Education Research Conference*, University of British Columbia, Vancouver, British Columbia, Canada. From <http://www.edst.educ.ubc.ca/aerc/2001/2001ziegler.htm>
- Andruske, C. (2003). "I am not sitting on the couch eating bon bons!": Women's transitions from welfare to paid work and education. In D. Flowers, M. Lee, M., A. Jalipa, E. Lopez, A. Schelstrate, & V. Sheared (Eds.). *Proceedings of the 44th Annual Adult Education Research Conference* (pp. 13-18). San Francisco State University, San Francisco.
- Beckerman, A., & Fontana, L. (2001). The transition from AFDC to PRWORA in Florida: Perceptions of the role of case manager in welfare reform. *Journal of Sociology and Social Welfare*, 28(3), 29-47.
- Bowman, J. (1998). The professional edge. In E. M. Berman, J. P. Wesy & S. J. Bonczek (Eds.), *The ethics edge*. (pp.159-164). Washington D.C.: International City/County Management Association.
- Boyatzis, R. E. (1998). *Transforming qualitative information*. Thousand Oaks, CA: Sage.
- Brodkin, E. Z. (1997). Inside the welfare contract: Discretion and accountability in welfare administration. *Social Service Review*, 31, 1-33.
- Cheetham, G., & Chivers, G. (1996). Towards a holistic model of professional competence. *Journal of European Industrial Training*, 20(5), 20-30.
- Hayes, E. (1999). Policy issues that drive the transformation of adult literacy. In L. Martin & J. Fisher (Eds.), *The welfare-to-work challenge for adult literacy educators: New directions for adult and continuing education*. San Francisco, CA: Jossey-Bass.
- Hayes, E., & Way, W. (1998). Negotiating the discourse of work: women and welfare-to-work educational programs. *Proceedings of the 38th Annual Adult Education Research Conference*, University of the Incarnate Word, San Antonio, Texas. From <http://www.edst.educ.ubc.ca/aerc/2001/2001ziegler.htm>
- Hayes, E., & Way, W. (2001). The politics of learning at work: Experiences of African American Women in entry-level jobs. *Proceedings of the 42nd Annual Adult Education Research Conference*, Michigan State University, East Lansing, Michigan. From URL <http://www.edst.educ.ubc.ca/aerc/2001/2001hayes.htm>

- Hollar, D. (2003). A holistic theoretical model for examining welfare reform: Quality of Life. *Public Administration Review*, 63(1), 90-104. From <http://newfirstsearch.altip.oclc.org/WebZ>
- Josephson, M. (1998). The six pillars of character. In E. M. Berman, J. P. Wasy & S. J. Bonzcek (Eds.), *The ethics edge*. (pp.13-21). Washington D.C.: International City/County Management Association.
- Lawler, P. A. (2000). Ethical issues in continuing professional education. In B. J. Daley & V. W. Mott (Vol. Eds.), *New Directions for Adult and Continuing Education: Vol. 86. Charting a course for continuing professional education: Reframing professional practice* (pp.63-70). San Francisco, CA: Jossey-Bass.
- Lipsky, M. (1980). *Street-level bureaucracy: Dilemmas of the individual in public services*. New York: Russell Sage.
- McDowell, B. (2000). *Ethics and excuses: The crisis in Professional responsibility*. Westport, CT: Quorum Books.
- Sandlin, J. A. (2001). Manufacturing workers: How Adult literacy and welfare-to-work programs construct the world of work. *Proceedings of the 42nd Annual Adult Education Research Conference*, Michigan State University, East Lansing, Michigan. From <http://www.edst.educ.ubc.ca/aerc/2001/2001sparks.htm>
- Sandlin, J. A. (2002). Text, lies, and the welfare state: the Portrayal of welfare women in welfare-to-work educational programs. *Proceedings of the 43rd Annual Adult Education Research Conference*, North Carolina State University, Raleigh, North Carolina. From <http://continuingeducation.ncsu.edu/aerc02/AERC02proceedings.pdf>
- Sidel, R. (1998). *Keeping women and children last: America's war on the poor*. New York: Penguin Books.
- Sparks, B. (1999a). Critical issues and dilemmas for adult literacy programs under welfare reform. In L. Martin & J. Fisher (Vol. Eds.), *New Directions for Adult and Continuing Education: Vol. 83. The welfare-to-work challenge for adult literacy educators* (pp.15-28). San Francisco, CA: Jossey-Bass.
- Sparks, B. (1999b). Poor women's education under welfare reform. *Proceedings of the 39th Annual Adult Education Research Conference*, Northern Illinois University, DeKalb, Illinois. From <http://www.edst.educ.ubc.ca/aerc/1999/99sparks.htm>
- Sparks, B. (2001). Collage of welfare-to-work perspectives: Views inside and outside the system. *Proceedings of the 42nd Annual Adult Education Research Conference*, Michigan State University, East Lansing, Michigan. From <http://www.edst.educ.ubc.ca/aerc/2001/2001sparks.htm>
- Sparks, B. (2002). Welfare women, high-risk consequences, and political agency. *Proceedings of the 43rd Annual Adult Education Research Conference*, North Carolina State University, Raleigh, North Carolina. From <http://continuingeducation.ncsu.edu/aerc02/AERC02proceedings.pdf>
- Wilkins, D. (1995). Redefining the "professional" in professional ethics: An interdisciplinary approach to teaching professionalism. *Law and contemporary problems*, 58, 241-258.
- Ziegler, M., & Durant, C. (2001). Engagement: A necessary ingredient for participation in adult basic education. *Proceedings of the 42nd Annual Adult Education Research Conference*, Michigan State University, East Lansing, Michigan. From <http://www.edst.educ.ubc.ca/aerc/2001/2001ziegler.htm>

The Effect of Active Student Responding in Computer-Assisted Instruction on Social-Studies Learning by Students with Learning Disabilities: A Brief Report

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Abstract: An alternating treatment design was used to compare the effects of three student response conditions (Clicking, Repeating, and Listening) during computer-assisted instruction on social-studies facts learning and maintenance. Results showed that all students learned and maintained more social-studies facts taught in the Repeating condition followed by the Clicking condition.

Much of the research regarding the efficacy of computer-assisted instruction (CAI) in special education has favored its use with this population of learners. However, limited empirical research exists that isolates and identifies the curricular variables that contribute to its effectiveness. This study evaluated one instructional variable found to be critical to traditional instruction: active student responding (ASR).

One of the most consistent findings in the educational literature is that students' achievement increases as a function of the time spent actively responding during instruction. Much of the support for increasing ASR during instruction comes from large-group correlational studies (e.g., Berliner, 1980; Fisher, Berliner, Filby, Marliave, Cahen, & Dishaw, 1980). Additional support comes from empirical studies of high-ASR, teacher-led strategies such as response cards and choral responding (e.g., Gardner, Heward, & Grossi, 1994; Sterling, Barbetta, Heron, & Heward, 1997), peer tutoring programs in which increased ASR is part of an instructional package (e.g., Barbetta & Heron, 1991; Utley, Reddy, Delquadri, & Greenwood, 2001), and error correction which includes ASR (Barbetta, Heron, & Heward, 1993; Barbetta & Heward, 1993; Drevno, Kimball, Possi, Heward, & Barbetta, 1994). With respect to CAI, a limited number of studies exist that demonstrate empirically the effects of ASR on student learning (Shin, Deno, Robinson, & Marston, 2000; Tudor 1995; Tudor & Bostow, 1991), and only one study was conducted with students with disabilities (Jerome, Barbetta, Rosenberg, & Brady, 2001). Jerome et al. (2001) compared ASR and on-task (OT) CAI instruction on the acquisition and maintenance of science facts among students with mental retardation. In the ASR condition, when prompted by the computer, students wrote the science facts on a study guide. During OT instruction, students listened to the science facts being read by the computer. Results showed that students learned science facts in both conditions with performances in the ASR condition being slightly higher.

The present study was designed to extend the results of Jerome et al. (2001) by comparing two types of ASR conditions (Clicking-ASR and Repeating-ASR) and an OT condition (Listening-OT) conditions on the acquisition and maintenance of social studies facts among students with learning disabilities using a hypermedia software program. This study differs from the previous study in that it was conducted with students with learning disabilities using social-studies curriculum. In addition, the present study was designed to determine whether the type of ASR used during CAI is critical to student learning by comparing two types of ASR (instead of one) with OT instruction.

Method

Participants and Setting

Participants were five fifth-grade students with learning disabilities, two females and three males, enrolled in a private school for students with learning disabilities. Parental permission, student consent, availability during the time of the study, and the participants' computer skills were used as inclusion criteria. The study was conducted in an assigned room.

Procedures

Each week for six weeks, the five students were provided daily one-to-one instruction on sets of 21 unknown social-studies facts using a hypermedia computer program. A new set of facts was practiced each week. Each set of 21 facts was divided randomly into three equal response-procedure groups: Clicking-ASR, Repeating-ASR, and Listening-OT.

Hypermedia lessons began weekly with the concept introduction lesson, followed by practice and testing. The concept introduction lesson consisted of a presentation of a hypermedia card that provided background information for the week's lesson. Practice using the three conditions (7 facts per condition) occurred immediately after the concept introduction and occurred four days per week, per set. During Clicking-ASR, the student was required to make an active response by clicking on the correct response. The social-studies fact was presented in print on a hypermedia card and was orally read by the computer. The student then moved to the next card and was directed to click on the correct response. For example, printed on the first card was "The US got its independence from Britain." The student then moved to the next card that had this same fact printed on it in a fill-in-the-blank form with two choices to complete the response. In this example, "The US got its independence from _____" was followed by the two choices, "Spain" and "Britain." On this card, the computer read the fact, and the student then clicked on one of the two responses ("Spain" or "Britain"). If the student clicked on the correct response (e.g., "Britain"), the computer read it. If the student clicked on the incorrect response a *breaking glass* sound was produced. The student then moved to the next card.

During Repeating-ASR, the student was required to make an active response by orally repeating the fact that was presented in print on the card and orally read by the computer. For example, "The first president of the USA was George Washington. Repeat." The student orally repeated the fact. The student then moved to the next card. During Listening-OT, the student listened to the social-studies fact that was printed on the card as it was read by the computer. The student was then prompted by the computer to listen as it was read again. For example, when the student clicked on the card, the computer read the social studies fact printed on the card. For example, "Ponce de Leon explored Florida. Listen. Ponce de Leon explored Florida." The student then moved to the next card. During weeks seven and eight, instruction occurred with seven unknown facts using only the best treatment.

Dependent Measures

Data for four dependent variables were collected: same-day tests, next-day tests, and one and-two week maintenance tests. The researcher orally administered the individualized tests. Same-day testing took place Mondays through Thursdays directly after the practice sessions and next-day testing immediately prior to practice sessions and/or Fridays' pretesting and/or maintenance tests. Maintenance tests were given one and two weeks after instruction on a set ended. An independent second observer collected interobserver agreement data and treatment integrity data to help ensure procedural reliability.

Experimental Design

An alternating treatments design with final best treatment phase was used to assess the effects of the three response conditions. The presentation order of the three conditions was randomized and counterbalanced to reduce the influence of sequence effects. Visual analysis of the graphed data was used for data interpretation. During the last two weeks of the study, only the “best” condition was administered to establish the relative effectiveness of its use in isolation and to demonstrate a much stronger functional relation.

Results

All five students learned and maintained more facts learned with Repeating-ASR followed by the Clicking-ASR and Listening-OT. On same-day tests, students scored highest in Repeating-ASR on 89 of 124 (72%) tests (See Table 1). On next-day tests, the students scored highest in the Repeating ASR condition on 81 of 124 (65%) tests (See Table 2). The one- and two-week maintenance tests results show that all five students maintained more Repeating-ASR facts. On one-week maintenance tests, students maintained 91.6% of the Repeating-ASR facts, 79.4% of the Clicking-ASR facts, and 75.1% of the Listening-OT facts. On two-week maintenance tests students maintained 93.2% maintained in the Repeating-ASR condition, 82.2% in the Clicking-ASR condition, and 74.3% in the Listening-OT facts.

Discussion

Students with learning disabilities learned and maintained more social studies facts instructed with Repeating-ASR followed by Clicking-ASR and Listening-OT. These findings lend further support to research showing a positive relation between active student responding and student achievement. This study adds a dimension to the ASR literature in that it demonstrated the positive effects of ASR during computer-assisted instruction.

The superior results of the two ASR conditions (compared to the OT condition) are supported in the ASR literature (Barbetta & Heron, 1991; Barbetta et al., 1993). As to why Repeating-ASR was more effective than Clicking ASR is not as clear. One possible reason relates to the practice and testing response requirements. During Repeating-ASR, students repeated the entire social studies fact, whereas during Clicking-ASR, students passively attended to the computer reading of much of the fact and actively engaged only while selecting the response to fill-in-the-blank. Subsequently, Repeating-ASR was more active than Clicking-ASR. Another possible reason relates to practice-testing response similarities. The type of responses students make during instruction may be related to their ability to respond correctly to similar test questions later (Gardner et al., 1994). During Repeating ASR, the practice and testing response requirements were identical.

The results have implications for classroom practice. Teachers should select or design CAI that promotes high rates of ASR. Further, the type of ASR required is critical. Although preliminary, these results suggest that the teachers should have an oral component in their CAI assignments. Students could be required to say the critical information (facts, numbers, concepts, names) as they select or click with the computer mouse (a traditional requirement).

The generalization of this study’s results will require direct and systematic replication of critical variables, such as learners, curricular area, level of thinking skill required, software features used, and/or ASR variations. A similar study could be replicated among students with other disabilities, typical learners (regular education students), students of other ages, and across other curricular areas. Future research could investigate the effects of ASR-CAI on higher-order thinking skills, such as drawing inferences or synthesizing information. More comprehensive use

of the components of hypermedia instruction (e.g., sound, animation, video-segments, and non-linear progression) could be included in future research.

References

- Barbetta, P. M., & Heron, T. E. (1991). Project SHINE: Summer home instruction and evaluation. *Intervention in School and Clinic, 26*, 276-281.
- Barbetta, P. M., & Heward, W. L. (1993). Effects of active student response during error correction on the acquisition, maintenance, and generalization of geography facts by elementary students with learning disabilities. *Journal of Behavioral Education, 3*(3), 217-233.
- Barbetta, P. M., Heron, T. E., & Heward, W. L. (1993). Effects of active student response during error correction on the acquisition, maintenance, and generalization of sight words by students with developmental disabilities. *Journal of Applied Behavior Analysis, 26*(1), 111-119.
- Berliner, D. C. (1980). Using research on teaching for improvement of classroom practice. *Theory into Practice, 19*, 302-308.
- Drevno, G. E., Kimball, J. A., Possi, M. K., Heward, W. L., & Barbetta, P. M. (1994). Effects of active student response during error correction on the acquisition, maintenance, and generalization of science vocabulary by elementary students: A systematic replication. *Journal of Applied Behavior Analysis, 27*, 179-180.
- Fischer, C. S., Berliner, D. C., Filby, N. N., Marliave, R., Cahen, L.S., & Dishaw, M. M (1980). Teaching behaviors, academic learning time, and student achievement. In C. Denham & A. Lieberman (Eds.), *Time to learn* (pp.7-22). Washington, DC: National Institute of Education.
- Gardner, III, R., Heward, W. L., & Grossi, T. A. (1994). Effects of response cards on student participation and academic achievement: A systematic replication with inner-city students during whole-class instruction. *Journal of Applied Behavior Analysis, 27*(1), 63-71.
- Jerome, A., Barbetta, P. M., Rosenberg, H., & Brady, M. P. (2001). A comparison of active student response and on-task computer assisted Hypermedia instruction on the learning of science facts by students with mental retardation. Unpublished candidacy research, Florida International University, Miami.
- Sterling, R. M., Barbetta, P. M., Heward, W. L., & Heron, T. E. (1997). Relative effects of active and no-response conditions on the acquisition and maintenance of health concepts by fourth grade students with developmental retardation. *Journal of Behavioral Education, 7*(2), 151-165.
- Shin, J., Deno, S. L., & Robinson, S. L., Marston, D. (2000). Predicting classroom achievement from active responding on a computer-based groupware system. *Remedial and Special Education, 21*(1), 53- 65.
- Tudor, R. M. (1995). Isolating the effects of active responding in computer-based instruction. *Journal of Applied Behavior Analysis, 28*(3), 343-344.
- Tudor, R. M., & Bostow, D. E. (1991). Computer-programmed instruction: The relation of required interaction to practical application. *Journal of Applied Behavior Analysis, 24*(2), 361-368.
- Utlely, C. A., Reddy, S. S., Delquadri, J. C., & Greenwood, C. R. (2001). Classwide peer tutoring: An effective teaching procedure for facilitating the acquisition of health

education and safety facts with students with developmental disabilities. *Education and Treatment of Children*, 24(1), 1-27.

Table 1

Mean Number of Facts Answered Correctly on Same-Day Tests

| Student | Clicking | | | | | Repeating | | | | | Listening | | | | |
|---------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| | Day 1 | Day 2 | Day 3 | Day 4 | Grand Mean | Day 1 | Day 2 | Day 3 | Day 4 | Grand Mean | Day 1 | Day 2 | Day 3 | Day 4 | Grand Mean |
| 1 | 1.4 (0-3) | 2 (0-5) | 2.5 (0-6) | 3.7 (2-6) | 2.4 (0-6) | 3.4 (2-4) | 4.5 (2-7) | 4.8 (4-7) | 4.8 (3-7) | 4.3 (2-7) | 1.6 (0-4) | 2.2 (0-4) | 3.2 (2-5) | 3.5 (2-5) | 2.6 (0-5) |
| 2 | 0.8 (0-2) | 1.2 (0-3) | 1.8 (0-3) | 2.3 (0-4) | 1.5 (0-4) | 3.6 (1-6) | 4.4 (2-7) | 5.2 (4-6) | 6.0 (5-7) | 4.8 (1-7) | 0.2 (0-1) | 0.8 (0-2) | 1.5 (0-3) | 1.7 (0-4) | 1.1 (0-4) |
| 3 | 3 (2-6) | 4.3 (2-6) | 5.3 (4-7) | 5.5 (5-7) | 4.5 (2-7) | 4.8 (3-7) | 5.5 (4-7) | 5.8 (4-7) | 6.5 (5-7) | 5.6 (3-7) | 1.0 (0-2) | 1.8 (0-3) | 3.0 (1-5) | 3.8 (1-6) | 2.4 (0-6) |
| 4 | 1.2 (0-3) | 2.2 (1-4) | 2.7 (1-4) | 4.8 (2-7) | 2.7 (0-7) | 3.2 (2-5) | 4.8 (4-6) | 6.0 (5-7) | 6.3 (6-7) | 5.0 (2-7) | 1.0 (0-2) | 1.8 (0-3) | 3.0 (1-5) | 3.8 (1-6) | 2.4 (0-6) |
| 5 | 2.3 (1-5) | 3.5 (1-6) | 4.8 (3-7) | 4.4 (3-7) | 3.7 (1-7) | 4.3 (3-6) | 6 (5-7) | 6.2 (5-7) | 6.6 (5-7) | 5.7 (3-7) | 1.2 (0-2) | 3.0 (1-5) | 3.6 (2-4) | 4.0 (2-5) | 2.9 (0-5) |
| Group | 1.8 (0-6) | 2.6 (0-6) | 3.3 (0-7) | 4.1 (0-7) | 2.9 (0-7) | 3.9 (1-7) | 5.1 (2-7) | 5.6 (4-7) | 6.0 (3-7) | 5.1 (1-7) | 1.0 (0-4) | 1.9 (0-5) | 2.8 (0-5) | 3.3 (0-6) | 2.3 (0-6) |

Note. The top rows of numbers represent mean performance on same-day tests on individual days and across all days (Grand mean). The bottom rows of numbers represent the range of scores.

Table 2
Mean Number of Facts Answered Correctly on Next-Day Tests

| Student | Clicking | | | | | Repeating | | | | | Listening | | | | |
|---------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| | Day 1 | Day 2 | Day 3 | Day 4 | Grand Mean | Day 1 | Day 2 | Day 3 | Day 4 | Grand Mean | Day 1 | Day 2 | Day 3 | Day 4 | Grand Mean |
| 1 | 1.4 (0-3) | 2 (0-5) | 2.7 (1-6) | 3.2 (2-6) | 2.3 (0-6) | 3 (2-5) | 3.3 (0-5) | 3.5 (1-5) | 4.5 (1-7) | 3.6 (0-7) | 0.4 (0-1) | 1.7 (0-3) | 2.3 (1-3) | 3 (1-4) | 1.9 (0-4) |
| 2 | 0.6 (0-2) | 1.2 (0-3) | 1.5 (0-3) | 2.3 (0-4) | 1.4 (0-4) | 2.4 (0-5) | 4.6 (3-6) | 4.8 (2-7) | 5.2 (2-7) | 4.3 (0-7) | 0 (0-0) | 0.4 (0-2) | 1.2 (0-3) | 1.7 (0-3) | 0.8 (0-3) |
| 3 | 1.2 (0-4) | 2.2 (0-2) | 2.8 (1-5) | 3.7 (1-6) | 2.5 (0-6) | 2.8 (1-4) | 4.5 (3-5) | 5.5 (4-7) | 6.5 (5-7) | 4.8 (1-7) | 1 (0-2) | 1.5 (0-3) | 2.7 (1-5) | 3.5 (1-5) | 2.2 (0-5) |
| 4 | 1.2 (0-4) | 2.2 (0-4) | 2.8 (1-5) | 3.7 (1-6) | 2.5 (0-6) | 2.8 (1-4) | 4.5 (3-5) | 5.5 (4-7) | 6.5 (5-7) | 4.8 (1-7) | 1 (0-2) | 1.5 (0-3) | 2.7 (1-5) | 3.5 (1-5) | 2.2 (0-5) |
| 5 | 2 (1-5) | 3 (1-6) | 3.6 (2-5) | 4.3 (2-7) | 3.2 (1-7) | 4.2 (3-5) | 5.5 (5-6) | 5.6 (4-7) | 6.3 (6-7) | 5.4 (3-7) | 1.7 (0-4) | 3 (2-4) | 3 (1-5) | 3.5 (1-5) | 2.8 (0-5) |
| Group | 1.3 (0-5) | 2.1 (0-6) | 2.7 (0-6) | 3.4 (0-7) | 2.4 (0-7) | 3 (0-5) | 4.5 (0-6) | 4.9 (1-7) | 5.8 (1-7) | 4.6 (0-7) | 0.8 (0-4) | 1.6 (0-4) | 2.4 (0-5) | 3 (0-5) | 1.9 (0-5) |

Note. The top rows of numbers represent mean performance on next-day tests on individual days and across all days (Grand mean). The bottom rows of numbers represent the range of scores.

Upper and Lower Body Anaerobic Muscular Power is Adversely Affected by Active Dehydration

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Abstract: A gap exists in the knowledge of acute dehydration and its effect on anaerobic muscular power. Therefore the purpose of this study was to examine the effects of active dehydration by exercise in a hot humid environment on anaerobic muscular power.

Muscular strength and power is considered a basic component of physical performance. The factors affecting strength have been studied intensively for more than half a century. While much work on the effects of water depletion on physical performance, has been summarized, in part, by Adolph (1947) there is a lack of experimental evidence concerning the effects of dehydration on anaerobic muscular power. Exercise and sports participation in hot and humid climates has recently received considerable attention throughout sports governing bodies, the athletic training community, and the media (Nielsen et al. 1981; Ftaiti, Grelot, Coudreuse, & Nicol, 2001; Jacobs, 1980). While Certified Athletic Trainers and coaches alike strive to increase performance, it is also necessary to understand how dehydration may adversely affect that goal. Allied health care providers, coaches, and governing bodies of sports need to be knowledgeable of the effects of dehydration and exercise in extreme temperatures.

There are two primary anaerobic energy sources, the phosphagen system and anaerobic glycolysis system. These two systems work together to provide the body with an immediate source of ATP for sports of very short duration or for burst-like sports, such as American football and basketball. Proposed physiologic mechanisms for a decrease in anaerobic muscular power are lacking; however, Sjogaard (1986) suggested that a loss of intracellular potassium might hyperpolarize the membrane electrochemical potential and reduce muscle contractibility. Faulkner (1980) who postulated that high muscle temperatures may elevate hydrogen ion concentration may inhibit phosphofructokinase activity and therefore anaerobic performance. This muscular function has been evaluated in dehydrated participants in previous studies using Wingate type tests (Jacobs, 1980; Webster, Rutt, & Weltman, 1988). Jacobs (1980) found that dehydration did not alter anaerobic exercise performance or post-exercise blood lactate levels. On the other hand Webster et al. (1988) found a 21% reduction in anaerobic power and a 10% reduction in anaerobic capacity in dehydrated (5% of body weight) participants. These studies demonstrate that discrepancies exist in evaluating muscular anaerobic muscle function. Further, the method of inducing dehydration through active (exercise combined with heat stress) or passive (e.g., heat exposure in saunas) means may produce varying degrees of muscle temperature increase and muscle function impairment.

Traditionally, researchers have investigated the detrimental effects of excessive heat on exercise performance and the clinical manifestations of exercise-induced hyperthermia. Discrepancies exist in the current body of knowledge regarding exercise-induced dehydration and its effects on muscular strength and power. A paucity of data exists on the effects of active dehydration induced by exercise in hot and humid environment specifically on muscular power. Therefore, the purpose of this study was to examine the effects of active dehydration by exercise in a hot humid environment on upper-body and lower-body anaerobic muscular power.

Methods

Experimental Design and Procedures

The experimental design consisted of a test-retest within subjects design. The independent variable was hydration (euhydrated and dehydrated) and the dependent variables were upper-body and lower-body anaerobic power. Participants ($n = 7$) performed the upper- and lower-body Wingate anaerobic test under each of two experimental conditions: euhydrated and dehydrated ($3.3 \pm 2\%$ reduction in body mass).

A familiarization session was conducted in which potential participants read and signed the health/injury history questionnaire and the informed consent form approved by the Florida International University Institutional Review Board. Participants were familiarized with the Wingate anaerobic tests. Instruction was provided in the proper use of the equipment as well as the proper techniques used with the cycle ergometer. Participants were instructed to abstain from ingestion of alcohol, caffeine, non-prescription medication, and dehydrating behaviors (sauna, diuretics, sweat suits, etc.) for the duration of the study. At the end of the familiarization session, baseline body mass and resting heart rate were measured and recorded.

Participants reported to the FIU Sport Science Research Laboratory at 9:30 am wearing an athletic supporter, mesh shorts, cotton t-shirt, sweat socks and running shoes. Participants were asked to completely void urine and body mass data were recorded. A euhydrated body mass was confirmed as less than +1% (or 0.4 kg) of baseline body mass recorded the previous day. A euhydrated condition Wingate anaerobic test was administered immediately followed by the heat stress trial to induce the criterion body mass loss of $\geq 3.0\%$ of baseline nude body mass. Several measurements of environmental conditions were recorded throughout the heat stress trial and recovery period. Upon completion of the heat stress trial, participants removed all clothing and towed dry for measurement of nude body mass. After dehydration was confirmed, the recovery period consisted of participants resting in thermoneutral environment until core body temperature returned to baseline (52.5 ± 20.1 min, range = 28 – 80 min). This delay was provided to allow muscle and core body temperature to return to normal and to allow the effects of heat exposure and exercise to subside before upper and lower body anaerobic power was assessed. Participants completed four administrations of a 30 s Wingate anaerobic tests (2 upper-body and 2 lower-body in the euhydrated and dehydrated conditions), and peak power, mean power, and decrease in power output were calculated and recorded.

Measurements and Procedures

Heat stress trial. A heat stress trial consisted of 45-90 min of treadmill exercise in a hot and humid environment (ambient temperature = 33.1 ± 3.1 °C, range 28.5-40.5 °C; relative humidity = $55.1 \pm 8.9\%$, range = 40.7-68.1%) with limited fluid intake. The heat stress trial commenced with a 5 min warm-up at 3.0 mph and the participants exercised for 40% of each participant's age predicted heart rate range. Treadmill speed was then increased, and the participants exercised at 60% of their age predicted heart rate range until at least a 3% body mass loss was achieved. A 60s rest was administered every 15 min of exercise. Ambient temperature and relative humidity were measured at 30 min intervals throughout the heat stress trial and the recovery period. All exercise was performed on a standard motor driven treadmill. As safety precautions, mean arterial pressure, heart rate, and core body temperature were measured within the first 10 min of exercise and monitored every 5 min throughout heat stress trial and recovery. If core body temperature exceeded 39.0 °C, the heat stress trial was terminated.

Wingate anaerobic tests. Participants completed the 30s Wingate anaerobic test on a cycle ergometer following a 3 min warm-up. The warm-up included 5s sprints against no

resistance after the first and second min. The warm-up was followed by a 2 min period of stretching. Participants were allowed to maximize pedal speed approximately 2s prior to test initiation in order to overcome the inertia of the flywheel. At time of test initiation, a predetermined load equal to 0.075 kg per kg of body weight was applied and a count of pedal revolutions began. Participants were asked to cycle as quickly and as forcefully as possible while remaining seated through the entire 30s duration of exercise. Pedal revolutions were recorded at 5s intervals using an electromagnetic counter (Nu-Metrics, Uniontown, PA). When the 30s test was completed, the load was reduced and the participants cooled down by pedaling against no resistance. Peak power was determined by number of pedal revolutions in the first 5s of frictional load. Mean power output was determined by averaging the six, 5s mean power output values (Seiler et al., 1990). Verbal encouragement was provided throughout the test.

The upper body Wingate anaerobic test was performed following the same instructions as the lower body test. The upper body test consisted of the cycle ergometer equipped with handles where the pedals are normally located. Participants were asked to sit in a comfortable position so that the feet were flat on the floor and so the cycle ergometer could be pedaled with no restrictions. At time of test initiation a predetermined load of 0.050 kg per kg of body mass was applied to the flywheel (Nindl, Mahar, Harman, & Patton, 1995).

Mood ratings. Mood was assessed to identify confounding variables that may affect performance of the upper and lower-body Wingate anaerobic tests. Mood was assessed prior to each administration of the Wingate anaerobic test. Motivation level was assessed by a visual analog scale designed to present to the respondent a rating scale with minimum constraints. The visual analog scale consisted of a 13 cm line with the left side being labeled “No Motivation At All” and the right side labeled “Highest Possible Amount of Motivation.” Participants marked the location on the line corresponding to the amount of motivation experienced at that time. The mark on the line was measured from the left to the nearest 0.1 cm and recorded for data analysis. Fatigue severity was determined using a question reading “At this moment what is your severity of fatigue?” with a 9-point Likert scale response. The response scale consisted of 1 = not at all, 3 = mild, 5 = moderate, 7 = severe, 9 = worst imaginable.

Participants. Seven apparently healthy (mean age = 27.1 ±4.6 years, and mass = 86.4 ±9.5 kg) males volunteered for the study. Participants were recruited from the student body at Florida International University and the surrounding community who have had no history of heat-induced illness and were resistance trained (anaerobic and aerobic workout at least two to three times per week). Males were selected to reduce the variability of ovarian hormone levels and substrate utilization between genders during exercise. Participant’s fitness level and health history was ascertained via the health history questionnaire and each participant was fully informed of the procedures and risks by signing an informed consent form approved by the Florida International University Institutional Review Board.

Statistical Analyses

The research design consisted of a test-retest design with the euhydrated and dehydrated condition as a within-subjects variable. Dependent t-tests were used to identify differences between the euhydrated and dehydrated conditions on mood ratings, thermoregulatory and cardiovascular responses to exercise, upper and lower body mean power output, upper and lower body peak power output, and upper and lower body decrease in power output over time. Descriptive statistics were performed for the anthropometric and environmental conditions measures. Data were analyzed using the SPSS 11.0 for Windows Statistical Package (SPSS, Chicago, IL) Significance was set at $P \leq .05$ for all statistical analyses.

Results

Participants rated mood prior to both upper and lower body anaerobic power performance tests. Motivation ratings were not significantly different ($t_6 = 2.322, P = .059$) in the euhydrated and dehydrated conditions; however, motivation was 23.0% decreased from the euhydrated (8.9 \pm 1.5 cm) to the dehydrated condition (6.8 \pm 3.2 cm). Fatigue severity was significantly ($t_5 = -4.134, P = .009$) increased 70% in the dehydrated (5.0 \pm 2.0) compared to the euhydrated (1.5 \pm .8) condition. Upper body mean power data revealed a significant ($t_6 = 3.307, P = .016$) 7.17% decrement in the dehydrated (1195.71 \pm 244.14 Watts) compared to the euhydrated (1406.86 \pm 260.31 Watts) condition. Lower body mean power data revealed a significant ($t_6 = 5.071, P = .002$) 19.20% decrement in the dehydrated (2202.00 \pm 377.04 Watts) compared to the euhydrated (2725.14 \pm 555.56 Watts) condition. Upper body peak power data revealed a significant ($t_6 = 2.456, P = .049$) 14.48% decrement in the dehydrated (1620.00 \pm 258.58 Watts) compared to the euhydrated (1894.29 \pm 346.16 Watts) condition. Lower body peak power data revealed a significant ($t_6 = 7.091, P \leq .001$) 18.36% decrement in the dehydrated (2888.57 \pm 448.07 Watts) compared to the euhydrated (3538.29 \pm 617.79 Watts) condition. No significant differences between the euhydrated and dehydrated conditions were found for upper body decrease in power output ($t_6 = -.266, P = .799$) or for lower body decrease in power output ($t_6 = -.247, P = .813$).

Discussion

The purpose of this study was to determine the effects of dehydration on anaerobic muscular power while controlling those extraneous factors that could affect anaerobic muscular power. In the current study participants rested in a thermoneutral environment (approximately 1.5 hr) following heat stress trial to reduce the effects of exercise and increased core body temperature on the anaerobic muscular performance test. Results from this investigation suggest that active dehydration of 3.3% body mass loss via exercise in a hot and humid environment has a negative effect on anaerobic muscular power. Previous studies (Houston, Marrin, Green, & Thompson, 1981; Jacobs, 1980; Nielsen et al., 1981; Webster et al., 1988) reported various effects of dehydration on muscular strength and power, although not all confounding variables were controlled, various methods were used, and the findings were inconclusive.

Anaerobic muscular performance has been evaluated using Wingate-type cycle ergometer tests and supramaximal endurance tests. Jacobs (1980) performed a comprehensive evaluation using anaerobic exercise performance tests including a Wingate test in participants that were euhydrated and dehydrated by 2%, 4%, and 5% body mass. Other researchers (Griewe, Staffey, Melrose, Narve, & Knowlton, 1988) examined peak torque during a maximal isometric voluntary contraction or time to fatigue for knee extensors and elbow flexors with no effects of dehydration (4% or more body mass loss) compared to euhydrated participants. Hedley, Climstein, and Hansen (2002) found no significant difference in one repetition maximum bench press but leg press strength was significantly decreased after the hyperthermic exposure (30 min of sauna exposure) compared to normothermic conditions. Further, these researchers reported a significant increase in muscular power after heat exposure. These researchers found that dehydration did not affect anaerobic exercise performance.

Our findings are similar to previous studies examining wrestlers and the effects of weight loss practices on muscle performance. Webster et al. (1988) reported a 21% reduction in anaerobic power and a 10% reduction in anaerobic capacity in participants dehydrated 5% of body weight. These researchers reported a large decrement in force production however his findings cannot be attributed to dehydration alone since participants exercised an additional 1-2 hours (after their 1.5 hour wrestling practice in order to make weight), in a rubberized suit,

performing primarily aerobic exercise. The extra exercise likely lowered both muscle and liver glycogen stores particularly since participants exercised 12 – 14 hours prior to laboratory testing.

Reducing or eliminating confounding variables is difficult in studies designed to simulate actual exercise environments. Similar to the current study, fatigue may have confounded results of previous studies examining exercise performance in simulated wrestling practices. Participants performed treadmill running while wearing an impermeable jacket and pants impeding sweat evaporation to induce dehydration and hyperthermia. On average, the pre-fatigue strength tests were completed 20 minutes before the treadmill run and the post fatigue tests started 8-12 minutes after the run to induce dehydration (Ftaiti, Grelot, Coudreuse, & Nicol, 2001). Findings of these studies cannot be attributed entirely to dehydration because of the fatiguing nature of the dehydration protocol. In one of the more comprehensive studies Nielsen et al. (1981) compared the results of a supramaximal exercise performance on participants dehydrated by diuretics (18% decrease in performance), sauna (35% decrease in performance), and exercise (44% decrease in performance). Each of the preceding procedures resulted in a relatively large reduction in plasma volume which has been considered the most likely physiological mechanism explaining the performance decrements during dehydration. Dehydration that develops during exercise is associated with relatively small reductions in plasma volume as compared to subjects that remain euhydrated during exercise (Sawka, 1988). Passive dehydration induced by diuretics or sauna exposure is not a good model for studying the effects of dehydration that develops during exercise, although it can be appropriate for studying the effects of beginning exercise in a hypohydrated state. Furthermore, passive modes of dehydration are unrelated to *in situ* physical activity in which most individuals participate. Our study utilized an *in vivo* active dehydration protocol which was designed to closely simulate typical physical activity environment. However in our study there was an average delay of 1½ hours from completion of heat stress trial to actual anaerobic power testing, during which core body temperature was measured every five minutes and participants were not allowed to proceed to power testing until core body temperature had returned to pre-heat-stress-trial measures. This would have presumably allowed recovery from the fatiguing nature of the heat stress trial.

Our findings concur with previous studies that demonstrated reductions in muscular strength due to dehydration (Bosco & Terjung, 1968; Webster et al., 1988) achieved by fluid restriction and by a combination of exercise and heat exposure. The most compelling decreases in muscular strength have been demonstrated using prolonged fluid restriction accompanied by a caloric deficit (Bosco & Terjung, 1968; Houston et al., 1981). Proposed physiologic mechanisms for a decrease in anaerobic muscular power are lacking; however, Sjogaard (1986) suggested that a loss of intracellular potassium might hyperpolarize the membrane electrochemical potential and reduce muscle contractibility. In the current study, electrolyte concentration was not measured, so loss of intracellular potassium theory cannot be confirmed. Our findings may be supported by Faulkner (1980) who postulated that high muscle temperatures may elevate hydrogen ion concentration and may inhibit phosphofructokinase activity and therefore anaerobic performance.

Dehydration may be achieved through passive methods such as fluid and food restriction, diuretics, or sauna exposure or by active methods such as exercise heat stress. In the current study, we demonstrated that active dehydration through exercise performed in a hot humid environment elicited reduced muscular power. Our findings suggest that actively dehydrated individuals have decreased muscular power and athletes may be more susceptible to injury or

reduced athletic performance when dehydrated by at least 3% body mass.

References

- Adolph E. F. (1947). *Physiology of man in the desert*. New York: Interscience.
- Bosco, J. S., & Terjung, R. L. (1968). Effects of progressive hypohydration on maximal isometric muscular strength. *Journal of Sports Medicine and Physical Fitness*, 8, 81-86.
- Faulkner, J. A. (1980). Heat and contractile properties of skeletal muscle. In S. M. Horvath & M. K. Yousf (Eds.), *Environmental Physiology: Aging, Heat and Altitude*. New York: Elsevier/North Holland.
- Ftaiti, F., Grelot, L., Coudreuse, J. M., & Nicol, C. (2001). Combined effect of heat stress, dehydration and exercise on neuromuscular function in humans. *European Journal of Applied Physiology*, 84, 84-87.
- Greive, J. S., Staffey, K. S., Melrose, D. R., Narve, M. D., & Knowlton, R. G. (1998). Effects of dehydration on isometric muscular strength and endurance. *Medicine and Science in Sports and Exercise*, 30, 284-288.
- Hedley, A. M., Climstein, M., & Hansen, R. (2002). The effects of acute heat exposure on muscular strength, muscular endurance, and muscular power in the euhydrated athlete. *Journal of Strength and Conditioning Research*, 16, 353-358.
- Houston, M. E., Marrin, D. A., Green, H. J., & Thomson, J. A. (1981). The effect of rapid weight loss on physiological functions in wrestlers. *Physician and Sports Medicine*, 9, 73-78.
- Jacobs, I. (1980). The effects of thermal dehydration on performance of the Wingate Anaerobic Test. *International Journal of Sports Medicine*, 1, 21-24.
- Nielsen, B., Kubica, R., Bonnesen, A., Rasmussen, I. B., Stokolosa, J., & Wilk, B. (1981). Physical work capacity after dehydration and hyperthermia: A comparison of the effect of exercise versus passive heating and sauna and diuretic dehydration. *Scandinavian Journal of Sport Science*, 3, 2-10.
- Nindl, B. C., Mahar, M. T., Harman, E. A., & Patton, J. F. (1995). Lower and upper body anaerobic performance in male and female adolescent athletes. *Medicine and Science in Sports and Exercise*, 27, 235-241.
- Sawka, M. N. (1988). Body fluid responses and hypohydration during exercise-heat stress. In Pandolf, K. B., Sawka, M. N., & Gonzalez, R. R., (Eds.), *Human performance Physiology and Environmental Medicine at Terrestrial Extremes*. Indianapolis, IN: Benchmark Press.
- Seiler, S., Taylor, M., Diana, R., Layes, J., Newton, P., & Brown, B. (1990). Assessing anaerobic power in collegiate football players. *Journal of Applied Sports Science*, 4, 9-15.
- Sjogaard, G. (1986). Water and electrolyte fluxes during exercise and their relation to muscle fatigue. *Acta Physiologica Scandinavia*, 128, (suppl 556):129-136.
- SPSS 11.0 for Windows Statistical Package Chicago, IL: SPSS
- Webster, S. F., Rutt, R. A., & Weltman, A. (1988). Effects of typical dehydration practices on performance. *Medicine and Science in Sports and Exercise*, 20, S20.

Metaphor: The Hidden Link between Visual Literacy and Learning

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Abstract: Visual Thinking Strategies (VTS) have been proven to enhance learning abilities in children. This study will examine how the use of metaphor might affect the development of fourth graders' verbal and written abilities at three schools in the Miami-Dade County Public School system.

As educators struggle to deal with falling literacy rates, many schools have turned to creative sources of expression and communication in an attempt to ignite student interest and understanding. For example, innovative Visual Literacy (VL) programs seek to provide students with an opportunity to deepen their understanding of targeted curriculum areas through art-based explorations. John Debes (1969, 1972) crystallized the concept of visual literacy by giving the theory its first, and longest lasting definition; he explained visual literacy as the ability to understand and use images, including the ability to think, learn, and express oneself in terms of images (Debes, 1972). Proponents of visual literacy maintain that students who engage in these sustained, art process-oriented experiences cultivate creativity and risk-taking while reinforcing critical thinking and communication skills.

In the late 1980s, cognitive psychologist Abigail Housen and veteran museum educator Philip Yenawine developed Visual Thinking Strategies (VTS) as an elementary school curriculum designed to teach Visual Literacy ("Who is Vts," 2001). As a visual arts program, Visual Thinking Strategies (VTS):

Uses a student-centered method to examine and find meaning in visual art; uses art to teach thinking, communication skills, and visual literacy; measurably increases observation skills, evidential reasoning, and speculative abilities, and the ability to find multiple solutions to complex problems; uses facilitated discussion to practice respectful, democratic collaborative problem solving among students that transfers to other classroom interactions, and beyond; uses eager, thoughtful participation to nurture verbal language skills, and writing assignments to assist transfer from oral to written ability; uses the Web to develop independence and computer skills as well as to assist teacher preparation; produces growth, including visual literacy and greatly enhanced verbal and thinking skills, in all students, from challenged and non-English language learners to high achievers; encourages art museum visits to underscore connections to art and to integrate a community resource into students' lives; and meets state standards in art, language and social studies; improves test scores in reading and writing. (What is Vts, 2001)

In the VTS curriculum, students examine carefully selected art images as teachers conduct open-ended discussions about sequenced works of art using developmentally based questions. Teachers begin by presenting images with a slide projector and asking the following open-ended questions: "What's going on in this picture?" "What do you see that makes you say that?" and "What more can we find in the picture?" Students verbalize their responses, opinions, ideas and interpretations, while teachers act as a facilitator, paraphrasing each student's comments, and linking observations when appropriate. Students are also encouraged to support

opinions with evidence, to listen and share information and ideas, and to construct meanings together. Ultimately, growth is stimulated by looking at art of increasing complexity, responding to developmentally-based questions, and participating in group discussions that are carefully facilitated by teachers. In addition, VTS has produced measurable growth in all learners across cultures, language/background experience, and learning abilities.

With research they have conducted over the past fifteen years throughout the United States and Eastern Europe, Yenawine and Housen have affirmed the efficacy of using the VTS curriculum. Teachers report that the majority of children who participate in the VTS curriculum learn to read more quickly, have greater comprehension skills, and are more capable of expressing whole concepts and completing whole thoughts in a sentence (Directory of Studies, 2001). After completing the ten-week VTS curriculum, students' writing improves as well. Students are more likely to write in complete sentences, which include more observations, to supply reasons to back up opinions, and to speculate among possible conclusions. Consequently, visual literacy is a valuable resource in aiding students to improve their reading, writing, and communication skills.

The link between art, visual literacy, teaching, and enhanced understanding remains elusive. When discussing the results of VTS, Yenawine himself cannot explain why children, after looking at a particular piece of art work and discussing it, might then be able to express their ideas and feelings in whole thoughts and sentences (Yenawine, 2003).

Visual art, from the simplest representation to the most complex piece, is primarily concerned with the creation of metaphor. Each mark on a canvas or piece of paper stands as an object in itself and as a metaphor, or pointer for, to or about something else. According to Lakoff and Johnson (1980), "the essence of metaphor is understanding and experiencing one kind of thing in terms of another" (p.5). Just as we use verbal language to communicate about and construct reality via a complex structure of metaphors, so too does art continually communicate and create in the language of visual metaphors. As metaphoric phrases and words give us insights into how things relate to each other, so too does visual art show how things are created from the ground up. When children are given the opportunity to examine how disparate elements are intentionally put together to create a particular piece, using color, shape and form, they begin to understand and experience "one kind of thing in terms of another." By understanding and experiencing metaphors in a particular format and between particular objects, it becomes easier for them to make these connections in other areas of learning, and even possibly to make their own metaphors.

Metaphor is as essential to the social studies as it is to the visual arts. Whether children are studying the culture of China, the geography of Florida, or the composition of their local government, they must be able to make connections between symbols and their meaning. In order to understand how people and places both influence and reflect social, political, and cultural values and attitudes, and to comprehend the historical process of change, children must intuitively grasp and use metaphor.

In 2002, the Wolfsonian Museum at Florida International University (FIU) was awarded a three-year grant from the U.S. Department of Education's Art in Education Development and Dissemination Program to enhance social studies education through an art-integrated curriculum in three Miami-Dade County Public Elementary Schools. This project, called *Artful Citizenship*, is a partnership led by The Wolfsonian at FIU with Miami-Dade County Public Schools (M-DCPS), researchers from FIU's College of Education, and a team of education researchers and evaluators from Florida State University. The four partners plan, develop, field test, implement,

evaluate, and disseminate *Artful Citizenship* as part of the core social studies curricula at grades 3, 4, and 5 at three Miami-Dade County public elementary schools that have a high percentage of students from low socioeconomic backgrounds. Teachers in these schools are being trained by Yenawine to use Visual Thinking Strategies with their students in order to provide them with the tools necessary to become visually literate.

Purpose

As a companion study to *Artful Citizenship*, the purpose of this study is to examine how the use of metaphor in the VTS curriculum might affect the development of fourth graders' verbal and written abilities at three schools in the Miami-Dade County Public School System. The questions considered include: How is metaphor used in the content of the VTS curriculum? Is metaphor used more by teachers or by students in the VTS curriculum? Does this ratio change through time? How is metaphor used in the pedagogy of the VTS curriculum? Do students use metaphor more in verbal or written discourse? Does the use of metaphor by the students change as they go through the VTS curriculum?

Theoretical Framework

Howard Gardner's theoretical framework, which examines the use of *multiple intelligences* in developing critical thinking tools, will be utilized in this study. In his book *Frames of Mind* (1983), and subsequent research, Gardner outlines the existence of eight ways of knowing, perceiving, and understanding the world around us: linguistic, mathematical, visual-spatial, musical, body-kinesthetic, naturalist, interpersonal, and intra-personal. Apart from the overt facilitation of visual-spatial intelligence, verbal-linguistic intelligence is fostered in several ways; for example, this can be seen manifested as students contribute to verbal discussions and most importantly, as teachers paraphrase each student's response. As teachers paraphrase, the students are introduced to concise and clear arguments, in addition to more complex vocabulary. Moreover, as students participate in discussions, interpersonal intelligence is demonstrated as students are given the opportunity to perceive and understand the different perspectives of their peers. Intra-personal intelligence is thus engaged as students continually assimilate and accommodate these perspectives into their thought structures. Everyone possesses all of these intelligences to some degree, asserts Gardner, and other ways of knowing are there, too, waiting to be discovered. Gardner emphasizes that one or two intelligences are often stronger and more fully developed in a person, although everyone has the capacity for nurturing all of them. The power of the model is its capacity for strengthening all multiple intelligences so that teachers can enable students to maximize their ability to respond, create, and perform in all academic areas.

Methods

A multiple-case study will be employed in which the researchers will use a mixed methods data analysis approach to examine how the use of metaphor in the VTS curriculum might affect the development of fourth graders' verbal and written abilities in three schools in the M-DCPS system. The case study design has been chosen because it has proven to be particularly useful when the research question is one of process (Merriam, 1998). Miles and Huberman assert that the use of multiple cases "strengthens the precision, validity, and stability of the findings of a single case" (p. 29). According to Tashakkori and Teddlie (2003), the mixed methods approach minimizes the inconsistencies or flaws inherent in a single method approach, and can yield richer, more valid, and more reliable findings than an analysis based on either the qualitative or quantitative method alone (Tashakkori & Teddlie, 2003).

This study will be conducted in six fourth grade classrooms at three schools in the M-DCPS. At least one of the teachers in each of the three schools will be FIU doctoral and master's

degree students who are National Board certified, or preparing for the National Board Certification. Mark Osterman, coordinator of educational programs at the Wolfsonian-FIU, an experienced VTS trainer, and curriculum supervisor for the *Artful Citizenship* project, will conduct a two-day training workshop for the teachers participating in the study. Data will be collected by the principal investigator and two graduate assistants in the Curriculum and Instruction program at FIU. The duration of the study will be from December 2003 to April 2004. Preliminary results of the study will be shared at the conference.

Data for this study will come from the following: taped recordings of teachers and students in the three M-DCPS as they engage in the teaching and learning of the Visual Thinking Strategies curriculum; written observations of teachers and students as they engage in the VTS curriculum; pre- and post-tests from the students; writing samples of the students as they address the images contained in the VTS curriculum; documents connected to the VTS curriculum; and primary and secondary source documents used in the fourth grade social studies curricula involved in the study. The pre- and post-tests will consist of students' written answers to a simple writing prompt, and will be administered at the schools. In addition, data will be collected during three site visits to the schools – one visit at the first VTS session, another visit at the fifth session, and another at the tenth session.

Pre- and post-test writing data will be analyzed using the Florida Writes rubric to measure for completeness of sentences, clarity and complexity of thought, and use of metaphors. The dependent samples T-test will be used to track changes over time. Tape recorded and written observations of teachers and students will be coded by the principal investigator and by the graduate assistants to ensure inter-rater reliability. Coding categories will emerge from the data itself. The data will be analyzed using ANOVA to look at changes over time, and teacher vs. student responses. VTS documents and Social Studies curricula will be chunked by emergent themes.

Significance

The VTS curriculum help students develop visual literacy, gain in language and thinking skills, and perform better on state mandated math, reading, and writing tests. For example, the Bard College/Red Hook School District Arts in Education Study found that elementary students who learned the VTS curriculum gained in their ability to engage in longer dialogues about art using more sophisticated vocabulary, and to view art from many different perspectives (Directory of Studies, 2001). A five-year study in Byron, Minnesota demonstrated that a cohort school that had used VTS since the 4th grade tested 23 percent higher on state tests in the 8th grade than the 8th graders in the same school the previous year, who did not have the luxury of VTS (Research Findings, 2001).

In this study, an attempt will be made to explain the reasons behind the success of VTS by deconstructing, through discourse analysis, the discrete elements used in the curriculum. The principle focus will be on metaphor even though the study will allow other possible essential elements to emerge as the investigators code the recordings of teachers and students while they engage in the teaching and learning of VTS.

Metaphors are a part of everyday speech that affects the ways in which we perceive, think, and act. Children seem to naturally use metaphor at a very early age. They readily pretend that dolls are people, sticks are swords, and they and their playmates are doctors and patients, understanding quite well that they are using one thing to mean another. Discovering and then consciously using metaphor in the highly successful VTS curriculum will allow teachers to be

more focused, critical, effective, and directed in both the pedagogical and content aspects of the VTS curriculum, and will help students make even more strides in their learning.

Conference Presentation

The investigators of this study readily admit that data will be lacking at the time of the conference. However, the presentation will compensate by consisting of a description of the VTS curriculum and the underlying theoretical framework, and a hands-on activity modeling the best practices of the VTS curriculum. Even though the data analysis will not be ready at the time of presentation, we strongly feel that the research and the hands-on activities will be of particular interest to many of the participants at the conference.

References

- Cronbach, L. J. (1975). Beyond the two disciplines of scientific psychology. *American Psychologist*, 30, 116-125.
- Debes, J. (1969). The loom of visual literacy. *Audiovisual Instruction*, 14(8), 25-27.
- Debes, J., & Fransecky, R. (1972). *Visual literacy: a way to learn—a way to teach*. Washington, DC: Association for Educational Communications and Technology.
- Frohmann, B. (1994). Discourse analysis as a research method in library and information science. *Library Information and Science Research*, 16(2), 119-138.
- Gardner, H. (1983). *Frames of mind: The theory of multiple intelligences*. New York: Basic Books.
- Lakoff, G., & Johnson, M. (1980). *Metaphors we live by*. Chicago: The University of Chicago Press.
- Miles, M. B., & Huberman, A. M. (1994). *Qualitative data analysis: An expanded source book*. Thousand Oaks, CA: Sage.
- Merriam, S. (1998). *Case study research in education: A quality approach*. San Francisco: Jossey-Bass.
- Tashakkori, A., & Teddlie (Eds.). (2003). *Handbook of mixed methods in social and behavioral research*. Thousand Oaks, CA: Sage.
- Who is Vts (2001). Retrieved April 7, 2004 from www.vue.org
- Yenawine, P. Personal communication, May 28, 2003.

Detention Home Teens as Tutors: A Cooperative Cross-Age Tutoring Pilot Project

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Abstract: Concerned professionals in the juvenile justice field frequently express concern for effective programs that help youth offenders successfully rejoin society. This mixed-method pilot study, involved detention home teens functioning as tutors for special education students in a public school. Tutors experienced gains in self-esteem and overall school/social attitude.

Several factors have been identified (Caliber, 2002; Leone, Mayer, Malmgren, & Misel, 2000) that put youth at risk for delinquency and other anti-social, behavioral problems. These dynamic factors may include poor academic achievement, lack of identification to the child's school, a peer support group that engages in and encourages problem behaviors, poor inter-familial relations, low self esteem, and a lack of identification to one's local neighborhood. The situation is further compounded when schools practice inconsistent and inequitable disciplinary measures (Skiba & Peterson, 2000). The end result often leads to substance abuse, school dropout, delinquency and sometimes violence.

The problem is further exacerbated by the trend towards punishment and retributive sanctions rather than rehabilitation for youth offenders (Empey, Stafford, & Hay, 1999). This may lead the offender to a feeling of helplessness, which can lead to recidivism and a continuation of the anti-social behaviors. Several researchers (Leschied, Jaffe & Willis, 1991; Henggeler, 1989) have found that quick-fix type programs do not really work for youth offenders and that once incarcerated the likelihood of re-offending actually increases. In a 5-year longitudinal study (Bullis, Yovanoff, Mueller & Havel, 2002) reported that youth released from the youth detention system performed poorly integrating back into the community. Clearly there is a need for practical and effective rehabilitative programs to help our youth rejoin society as productive, successful members.

The technique of cross-age and peer interactive learning, or peer tutoring (PT), has long been found to offer a variety of benefits for both the tutee and the tutor, including improvements in behavior and social skills (Kamps, Kravits, Stolze, & Swaggart, 1999; Lazerson, 1988). This has occurred in both school related settings, such as the traditional classroom (Gautrey, 1990), as well as non-academic settings such as the sports field, music instrument practice, etc. Lazerson (1980) found that behavioral problem tutors and tutees experienced significant gains as a result of engaging in consistent tutoring sessions. This current cross-age peer tutoring trial project was designed to help meet the unique needs and demands of youth already processed through the juvenile justice system. Individuals from a detention home (DH) in western New York State would function as tutors for younger students in a Buffalo, New York public school.

Method

Participants

All new research projects have some degree of risk involved. Risk was intensified since the study required detention home youth coming into the public school and interacting with the students. Three detention home teenagers would come to the school to tutor the younger tutees. The PT would begin on a six-week trial basis, with the detention home participants tutoring every school day for one

period of up to 60 minutes. Three additional detention home teens, with similar backgrounds and educational difficulties, were chosen as the control group.

The Tutors – Brief Profiles

According to the law, the three tutors, John, Sean & Lynn, were “habitually truant, disobedient, ungovernable, incorrigible, and beyond control of parents and other lawful authority.” Each of them was adjudicated in a formal court hearing and placed in a secured group home because, according to sworn testimony, there was “significant likelihood” that they would either abscond or continue to engage in delinquent activity.

John, a 15 year old youth, had been in foster care or institutions since he was two years old. The detention home staff reported that John arrived at the group home “fighting, cursing, and swearing.” This was his 11th placement in 13 years. Sean, another 15 year old, was identified as a “sneaky, lying con-artist.” He was torn between his divorced parents who attempted to “buy his attention, or flatly reject him.” Lynn was a 16 year old girl characterized as “withdrawn and disinterested.” She had been beaten and abused by her parents. Her sarcasm and steadfast refusal to cooperate in the most minor ways drove people from her within moments of meeting her. A social worker wrote that all three of the tutors were “angry, confused, hurt youngsters who had learned to mask their feelings under a facade of ‘I don’t care what the hell happens.’” It would be difficult to locate a group of young people with lower self-esteem.

All three of the tutors had been educationally tested at reading levels near the third grade, and none of them reported any positive educational experiences from previous school settings. However, since low self-concept seemed to be their most pressing concern, they were picked before other DH youth with similar learning problems.

Materials

The focus of the tutoring sessions was mainly reading comprehension on a first grade level and decoding. In addition, the tutors were given a variety of basic math materials, such as blocks, sticks, flash cards, etc., to help improve the tutees in this area as well. Self-concept was evaluated by a system initially designed by Luszki and Schmuck (1974). On this scale one notes the discrepancies, if any, between the individual’s notion of actual-self to ideal-self. The author added several terms to this particular scale, for it was reasoned that they would indicate important aspects of self-esteem. Terms such as healthy, bored, close to teachers, close to parent(s), close with peers, successful, tired, etc., were added to this assessment device.

| I Am: | | | | I’d Like To Be: | | |
|---------------|------------------|-------------|-------------|-----------------|------------------|-------------|
| Almost Always | Half of the Time | Hardly Ever | | Almost Always | Half of the Time | Hardly Ever |
| | | | Friendly | | | |
| | | | Bored | | | |
| | | | Studious | | | |
| | | | Likeable | | | |
| | | | Happy | | | |
| | | | Shy | | | |
| | | | Smart | | | |
| | | | Smart | | | |
| | | | Mean | | | |
| | | | Popular | | | |
| | | | Destructive | | | |

| | | | | | | |
|--|--|--|-------------|--|--|--|
| | | | *Close to: | | | |
| | | | *Classmates | | | |
| | | | * Dad | | | |
| | | | *Mom | | | |
| | | | *Sibling(s) | | | |
| | | | Tired | | | |
| | | | Honest | | | |
| | | | Brave | | | |
| | | | Lazy | | | |
| | | | Cooperative | | | |
| | | | Healthy | | | |
| | | | Jealous | | | |
| | | | Worried | | | |
| | | | Successful | | | |

Teacher and tutor questionnaires were sent out at the end of the study to supply further insight and information regarding the program. These forms were very important to the project for they would reflect the effectiveness of the program from both tutor and teacher perspective. In addition, informal, in-depth, open interviews were conducted. It was reasoned that this qualitative research technique would provide additional relevant information and insight into the various facets of the program.

Procedures

The tutors first attended two training sessions for the project. During these sessions, the tutors practiced and role-played how to reinforce correct statements from “their students” and how to properly correct mistakes. The tutors met with their students each school day for a 45 – 60 minute period. Initially, in order to make sure that they would not abscond, a detention home staff had to escort them to and from the public school. The social worker also had to remain in the building while the tutoring was going on. Tutors had special sign-in sheets to mark their arrival and departure times. Weekly staff meetings were held between the program director (and author) and the tutors. At these informal meetings we discussed ideas, accomplishments of the previous week, and, of course, any personal gripes or issues that they had.

Results

Self-Concept

The self-concept scale was administered on a pre and post-test basis, to both the participants and the control group. All three tutors experienced dramatic gains in self-concept. The N for this trial project was too small to perform statistical analysis. Still the scores of the three DH tutors were so profound to serve as some indication of the program’s success. The average decrease of discrepancies on this scale was 15 (Table 1) as compared with the control group who actually experienced an increase in the number of discrepancies on the post-test, from 23 to 25.

It is reasoned that the lower the number of discrepancies the higher the self concept, for the “actual self” more nearly matches the individual’s “ideal self.” Only one of the DH control group showed a slight improvement on self-concept post scale, going from a score of 28 to 26 discrepancies. Based on the information generated from these scales, the tutors felt more confident of themselves both intellectually and emotionally.

Table 1

Number of Discrepancies on Self-Concept Scale

| | Pre-Test | Post-Test |
|--------------------------------------|----------|-----------|
| Tutors | 1.26 | 1.8 |
| | 2.21 | 2.11 |
| | 3.24 | 3.5 |
| M=23 (15 fewer discrepancies) | | |
| Control | 1.28 | 1.26 |
| | 2.29 | 2.23 |
| | 3.22 | 3.26 |
| M=23 (Increase of two discrepancies) | | M=25 |

Teacher Questionnaires and Interview Feedback

To nearly everyone's surprise, the tutors turned out to be true assets to the cooperating teachers and to their students. They described the tutors as "capable, sincere, and hard working young people" – a far cry from the labels the courts used to describe them. Teachers reported that the tutors assumed a variety of responsibilities, and that this load increased throughout the duration of the project. They noted that the tutors quickly adapted to their new roles and performed functions such as correcting exams and paper work, running off dittos, leading small math and reading groups, and escorting the class to and from various specials, like art and gym. All of the cooperating teachers indicated not only a willingness to carry on with the project, but, in fact, showed a strong desire to continue. One teacher wrote that she was "very disappointed that the project was ending – my tutor was such a big help to me!" Another stated that he had been "frustrated at the lack of help from city hall and all the 'red-tape' with large, special ed classes with no teacher assistants." The tutor had been like a "gift from above."

Tutor Questionnaires and Interview Feedback

Based on tutor responses from both the questionnaires and the informal interviews, all three tutors found the project to be very successful. It was, in fact, quite remarkable to read their questionnaires for one would think that they had been filled out by college student teachers. For example, on the question "how can the program be improved?" the tutors wrote the following responses: "Suzy needs to work individually or with one other student so she won't be so distracted" and "Curtis must work with concrete objects before going into subtraction." John wrote that one of his tutees "needed more than praise, maybe some real rewards, like candy or stickers, or even movie tickets." When the teacher didn't follow through on his suggestion, he simply brought in some tangible rewards on his own. In other words, the tutors filled out these forms as teachers, not as troubled-individuals from a detention home. During the interview sessions, they indicated that this was their first real positive experience with "the system" in general, and with school in particular. Sean remarked that he was "tired of everyone trying to save us, when we proved we could save ourselves... all we needed was a real shot at it without somebody always breathing down our necks."

Report from Detention Home Staff

The following is a summary of the project from the director and social worker of the detention home.

At first they were nervous and slightly suspicious. Each had their fill of "programs that will help you." But this was different – they were helpers. Cautiously, they agreed to try.

Within days the effects were noticeable. John, a loner who had no close friends in the home, emerged as a leader. A defensive non-reader, he began to pick up books – “So I can help my kids.” A virtual school phobic, he looked forward to going to school. Intensely distrustful of adults and especially authority figures, he began to talk openly about “his” teacher, “his” supervisor Dr. Laz, and “our” school. His temper was still a problem and he still became easily frustrated, but when reminded that such behavior was inappropriate for someone working with kids, he began to seriously work on it. We knew he was onto to something mighty important when he decided to ride his bike (to tutor) in a downpour rather than stay back at the home, where he’d be nice and dry. He simply couldn’t miss teaching his kids. Sean saw abundant opportunities to con everyone. Then he began to notice that he didn’t have to. He was treated well, with respect, with the assumption that he was capable and responsible, and that he didn’t have to play games to get it. Probably the most dramatic turnaround came with Lynn. A very angry, sarcastic, and bitter girl, she viciously bad-mouthed John and Sean for initially “ass-kissing” the staff. She resisted any attempt to deal with her attitude. But gradually, as she saw what was happening to the boys, she began very cautiously to ask questions about the program. Finally, we confronted her. It seemed she really wanted to get involved but couldn’t back down from her stand. We agreed to let her see how it worked. Above the objections of John and Sean, who were sure she’d wreck “our program” by abusing her freedom, Lynn entered the program. Her current highly successful adjustment in a girl’s residential program is attributed by her to the experiences she had as a student teacher in this unique project.

Discussion

Needless to say, due to such a small N, one must be careful to generate these positive results to other teens in the detention home system. Furthermore, it is possible that such high results were achieved due to the small director/tutor ratio, rather than the actual treatment itself. However, since the results were so promising, the program merits further testing with a larger N and control group. Since all of the cooperating teachers expressed a strong interest in continuing the project, it is very likely that tutoring projects such as these may offer inexpensive, workable solutions for teachers with large special needs class sizes with few or no assistants. At the present time, all of the tutors involved in this project have successfully left the detention home system to pursue community-oriented jobs. Upon conclusion of the project during the last staff meeting, the author asked the tutors to share some of their feelings about themselves and the project. Three salient points were expressed by the tutors: an increase in self-worth; an improvement in self-control; and a sense of responsibility to their students. “I don’t want to happen to them what happened to me,” John commented. They noted that this was the first time in their lives that they had been put in a position of giving, rather than always on the receiving end. Lynn remarked that she was “sick of people always looking at me like I’m some sort of reject, a loser.” She added that the tutoring project gave her a chance to “prove ‘em wrong... that I’m good enough to help others.” A salient factor which emerged from their interview responses was that they all felt more in control of their own lives and destiny than before. Further research might focus on locus-of-control, rather than a general notion of self-concept. These three tutors may have helped pave a route out of a system that often seems more like a dead-end than anything else, for dozens, perhaps hundreds like themselves. They have shown that they are willing, and indeed capable, to handle responsibility when given the proper circumstances and opportunity.

References

- Bullis, M., Yovanoff, P., Meuller, G., & Havel, E. (2002). Life on the “outs” - Examination of the facility-to-community transition of incarcerated youth. *Exceptional Children*, 69, 7-22.
- CaliberA.[Author: First initial missing.] (2002). *The promise of law related education as delinquency prevention*. Chicago, IL: American Bar Association Division for Public Education.
- Empey, L.T., Stafford, M.C., & Hay, C.H. (1999). *American delinquency: Its meaning and construction* (4th ed.). Belmont, CA: Wadsworth.
- Gautry, F. (1990). Cross-age tutoring in Frankley. *Reading*, 24, 21-27.
- Henggeler, S.W. (1989). *Delinquency in adolescence*. Newbury Park, CA: Sage.
- Kamps, D., Kravits, T., Stolze, J. & Swaggart, B. (1999). Prevention strategies for at-risk students and students with EBD in urban elementary schools. *Journal of Emotional & Behavioral Disorders*, 7, 112-118.
- Lazerson, D. B. (1988). The effectiveness of cross-age tutoring with truant, junior high school students with learning disabilities. *Journal of learning Disabilities*, 21, 253-255.
- Leone, P. E., Mayer, M. J., Malmgren, K., & Misel, S. M. (2000). School violence and disruption: Rhetoric, reality and reasonable balance. *Focus on Exceptional Children*, 33, 1-20.
- Leschied, A. W., Jaffe, P. G., & Willis, W. & Willis, W. (1991). *The young offenders act: A revolution in Canadian Juvenile Justice*. Toronto, ON: University of Toronto Press.
- Luszki, M. B., & Schmuck, R. (1974). *Diagnosing classroom learning environments*. Chicago, IL: Science Research Associates.
- Skiba, R. J., & Peterson, R.L. (2000). School discipline at a crossroads: From zero tolerance to early response. *Exceptional Children*, 66, 335-347.

Hyponatremia in Endurance Athletes

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Abstract: The purpose of this paper was to identify the relationship between hyponatremia, or water intoxication, and endurance athletes. Athletic trainers and paramedics must be educated about this potentially fatal problem and be able to determine the appropriate treatment for a hyponatremic athlete.

Hyponatremia or water intoxication is a condition that most likely results from fluid overload and has become increasingly common in endurance athletes (Davis et al., 2001; Irving, Noakes, Buck, & Smit, 1991; Speedy, Noakes, & Schneider, 2001). Hyponatremia is associated with a decrease in plasma sodium due to overhydration with hypotonic solution (water) or an excess in sodium excretion through sweating. In either case, hyponatremia is an abnormal ratio of plasma sodium to water, which is defined by a sodium concentration less than 135 ± 5 mmol/L where normal plasma sodium is 135 - 146 mmol/L (Cleary & Casa, 2003; Davis et al., 2001; O'Brien, 2001; Speedy, Faris, Hamlin, Gallagher, & Campbell, 1997; Speedy et al., 1999). Hyponatremia ranges in severity from asymptomatic or mild (malaise, confusion, nausea, fatigue) to symptomatic or severe (seizures, coma, and even death). Hyponatremia has been described as a potentially dangerous and sometimes fatal problem for endurance athletes (Speedy et al., 1999).

Increasing awareness of hydration as a preventative measure for heat illness and the increased popularity of endurance events may have lead to the recent increase in cases of hyponatremia (Cleary & Casa, 2003). A large problem for the athletic population has been the prevention of heat illness and a great emphasis has been placed on avoiding dehydration. Dehydration is a severe problem, as demonstrated by the near 20,000 Egyptian deaths attributed to water deficit and heat illness in the Six-Day War of 1967 (O'Brien, 2001). Israeli troops who stressed rehydration have been successful in minimizing heat casualties (O'Brien, 2001). Army recruits are encouraged to drink large amounts of water to minimize heat illness caused by dehydration. With the increased awareness and emphasis on hydration, overhydration is becoming increasingly problematic. In 1997, a large Army training post in the southeast U.S. reported five cases of hyponatremia in July, one case ended in death (O'Brien, 2001). Increased emphasis on drinking large amounts of water to avoid heat-related illness may inadvertently contribute too many cases of hyponatremia. Therefore, the purpose of this paper was to identify the relationship between hyponatremia and endurance athletes, such as marathon runners and triathletes. We seek to educate allied health professionals, coaches, and athletes about this potentially fatal problem.

Methods

A MEDLINE® search was performed to acquire medical literature from 1990 – present. Data were reviewed with an emphasis on current research (since 1990). Empirical studies, case reports, and medical recommendations for physically active individuals that developed hyponatremia were reviewed and summarized. Data were collected by review and synthesis of clinical empirical studies, case reports, positions papers, and classic hydration/heat illness research.

Results

Prevalence of Hyponatremia

Triathlons and other ultra-distance events have increased in popularity in the last 15 years (Speedy et al., 1997). Occasionally, drinking requirements have been so emphasized that the ingestion of excessive volumes of hypotonic fluid during exercise has led to hyponatremia in ultra endurance athletes and in military recruits (Armstrong, Curtis, Hubbard, Francesconi, Moore, & Askew, 1993). For our purposes, an ultra-endurance event is considered an athletic event lasting over eight hours. However, new research indicates that hyponatremia may also be identified in events lasting under four hours. Case reports (O'Brien, 2001) of hyponatremia after ultra-endurance or shorter endurance exercise have accumulated in recent years. Increased participation by less well-trained athletes with resultant prolonged finish time and increased environmental exposure may be contributing factors (Hsieh, Roth, Davis, Larrabee, & Callaway, 2002). Several studies in various Ironman triathlons have reported that up to 9% of runners that collapse during these events to be hyponatremic and that 13 to 29% of athletes treated at medical tents are hyponatremic (Hsieh et al., 2002; Noakes et al, 1990; O'Toole et al, 1995; Speedy et al, 1999;). Noakes et al., (1990) reported that symptomatic hyponatremia occurs in less than 0.3% of competitors during prolonged exercise and in as many as 9% of runners that collapsed during a 186 km ultra-marathon. Although most research suggests that hyponatremia may only be prevalent in ultra endurance events, hyponatremia has been reported to occur during marathon running. Hsieh et al. (2002) reported that 5.6% of marathoners requiring medical attention were hyponatremic and Davis et al. (2001) reported treating a total of 25 marathoners with hyponatremia during the marathons in 1998 and 1999. In many Army recruits, hyponatremia has been a result of overly aggressive rehydration (O'Brien, 2001). A report from the U.S. Army Inpatient Data system was used to identify all hospitalizations for hyponatremia from 1996 and 1997. Patients with water intake rates equal to or exceeding 2 quarts per hour and several cases of hyponatremia resulted from aggressive fluid replacement practice for soldiers in training (O'Brien, 2001).

Female endurance athletes reportedly have the highest risk for the development of hyponatremia. As many as 45% of female race finishers in the New Zealand Ironman triathlon developed hyponatremia compared to 14% of male race finishers (Speedy et al., 2001). Hyponatremic marathoners were reported to be more often to be female, use non-steroidal anti-inflammatory drugs, and have slower finishing times than normonatremic race finishers (Speedy et al., 2001). Females may be more susceptible than males because they have lower fluid requirements, as they are usually smaller, have smaller fluid compartments, and take longer to finish the race (Davis et al., 2001; Speedy et al., 2001). Other populations at risk for hyponatremia are individuals that are unable to accurately estimate sweat loss and slower racers (Noakes, 1992).

Etiology of Hyponatremia

The etiology of hyponatremia remains enigmatic. Three main theories exist, the first theory, states that hyponatremia is caused by large water and salt losses through sweat during prolonged exercise so that athletes with this condition are both dehydrated and sodium depleted. Large sodium chloride and fluid losses in urine and sweat occur either chronically before or acutely during exercise (Noakes, 1992; Speedy et al., 2001). Research (Noakes, 1992; Speedy et al., 2001) on the first theory of large water and salt losses does not have much validity since pre-exercise and post-exercise body mass were not measured in these studies. The second theory has become more accepted and appears to have more supporting evidence. This theory states

that hyponatremic athletes have normal sodium plasma concentrations and osmolality but become over hydrated by consuming more fluid than needed (Douglas, Laird, & Hiller, 1995; Noakes, 1992; O'Toole, 1995; Speedy et al., 2001). Irving et al., (1991) reported conclusively that eight subjects who collapsed with hyponatremia in an 88 km ultra-marathon were fluid overloaded and had an extremely low average plasma sodium concentration of 122.4 ± 2.2 mmol/L. During a New Zealand Ironman Triathlon, of the 95 athletes requiring medical care, hyponatremia accounted for 9% of the total athletes treated in the medical tent. One athlete had gained 2.5 kg of body fluid by the end of the race (Speedy et al., 1996). One final theory that is not as well researched postulates that hyponatremia develops from fluid retention from potentially abnormally increased antidiuretic hormone secretion during prolonged exercise in athletes drinking excessive volumes of fluid. Excess fluid may not be processed by the kidneys during endurance exercise raising the possibility of some abnormality in renal function or antidiuretic hormone balance (Speedy et al., 1996). This theory needs more research to be considered. The etiological mechanisms of hyponatremia are still under considerable debate. However, the overall consensus is that hyponatremia is caused by fluid overload, resulting from high rates of fluid intake with an inappropriate renal response causing fluid retention (Speedy et al., 2001).

Treatment of Hyponatremia

Signs and symptoms of hyponatremia are very similar to those of many other heat related illnesses; therefore it is of utmost importance for athletic medical professionals to make an accurate differential diagnosis for appropriate treatment. Athletes competing in ultra endurance events are shown to have a 2-3% of body weight loss unrelated to fluid loss (O'Toole et al., 1995). Since a 2-3% loss of body weight for an ultra endurance event is not uncommon, an athlete with no loss in body weight may be susceptible to developing hyponatremia. Symptoms of mild or moderate hyponatremia include malaise, nausea, light-headedness, and fatigue. The most common symptoms of army recruits with severe hyponatremia were: change in mental status (88%), vomiting (65%), nausea (53%), and seizures (31%) associated with an average plasma sodium concentration of 122 ± 5 mmol/L (O'Brien, 2001).

The correct treatment for hyponatremia is currently under debate. Hyponatremia ranges from asymptomatic to very severe resulting in death. Whenever possible, athletes should first have a history of fluid ingestion prior to and during competition. Since hyponatremia is usually due to a fluid overload, body mass loss or gain should be assessed. Plasma sodium levels should be measured to determine the severity and thus the appropriate treatment. Asymptomatic hyponatremia treatment consists of close observation with fluid restriction while allowing spontaneous diuresis to ensure that the athletes' condition does not deteriorate. An athlete with symptomatic hyponatremia who is clinically stable and without signs or symptoms of cerebral or pulmonary edema, on-site management in the medical tent may be appropriate (Speedy et al., 2001). However, severely hyponatremic athletes with central nervous system dysfunction should immediately be hospitalized for further evaluation and treatment.

Once hospitalized, controversy exists regarding appropriate treatment of the hyponatremic athlete. The rate at which the sodium level should be corrected is currently under debate by emergency physicians. Rapid correction could cause cerebral demyelination while slow correction could result in the detrimental effects of persistent hyponatremia (Abraham & Jacob, 2001). Rapid correction of exercise induced hyponatremia using hypotonic saline solution with a final target of 130 mEq/L not exceeding 155 mEq/L appears to be both safe and effective. Hypotonic saline solution has advantages by both replenishing the salt deficit and

redistributing intracellular water to relieve cerebral edema (Abraham & Jacob, 2001; Davies et al., 2001). However, danger may exist in the potential for overcorrection of hyponatremia once antidiuretic hormone secretion has ceased in response to administration of the saline. Other physicians take a more conservative approach (Davies et al., 2001). Regardless, the rate at which plasma sodium should be corrected depends on the clinical presentation and the duration of symptoms (Abraham & Jacob, 2001).

Recommendations and Prevention

Endurance athletes are often aware of the dangers of dehydration but are rarely aware of the potential complications associated with overhydration. Appropriate individualized fluid replacement strategies should be implemented, particularly since standard recommendations for fluid replacement may be too high for athletes with low sweat rates or too low for those with high sweat rates (Cleary & Casa, 2003). Noakes et al., (1992) has suggested that a fluid intake of 500 mL/hr is appropriate for most non-competitive athletes during prolonged exercise. The American College of Sports Medicine's (Convertino et al., 1996) position statement recommended between 600 mL/hr and 1200 mL/hr. Current recommendations on fluid replacement are based on short events and no guideline for ultra endurance events exists at this time. Consuming fluids rich in sodium is advisable since it is possible that sodium deficiency may play a role in athletes that develop hyponatremia (Speedy et al., 2001).

All studies reviewed agree that prevention of hyponatremia in endurance and ultra endurance athletes is necessary. Increasing the awareness of dehydration and hyponatremia must continue for effective prevention. Decreases in the prevalence of hyponatremia occur when athletes are aware of the conditions and its associated problems (Speedy et al., 2001). As previously mentioned, disagreement exists in the recommended appropriate fluid intake (Noakes et al., 1990). Agreement does appear to exist with including fluids rich in sodium may help to prevent hyponatremia. Water replacement guidelines have been revised, and water consumption based on both physical activity and weather conditions were implemented throughout the Army due to increased incidences of hyponatremia (O'Brien, 2001). Precise fluid replacement guidelines have yet to be determined for the recreational and competitive endurance athletes.

Clinical Implications

More research is needed in the prevalence, etiology, and treatment of hyponatremia in endurance athletes. Information about hyponatremia must be disseminated to all athletes participating in marathons or ultra endurance events. Coaches should be made more aware of the possible severe complications of hyponatremia and relay those concerns to athletes. Coaches should also be aware that females are at a greater risk and should individualize fluid replacement strategies based upon body size, race speed, and weather conditions. Nutritionists may recommend a sport drink including sodium as fluid replacement during endurance and ultra endurance events. It is of great importance for athletic trainers and paramedics to be aware of the signs and symptoms of hyponatremia and that fluid replacement is an inappropriate treatment for an athlete with hyponatremia. Pre- and post-body event weights should determine and if possible, a portable clinical sodium analyzer should be on site at all major endurance events. Coaches, nutritionists, athletic trainers, and athletes must be educated about this potentially fatal problem.

References

Abraham, A. B. I., & Jacob, C. K. (2001). Severe hyponatremia: Current concepts on pathogenesis and treatment. *The National Medical Journal of India*, 14, 277-283.

- Cleary, M. A., & Casa, D. J. (2004). *Exertional hyponatremia: Considerations for the medical staff*. Manuscript submitted for publication.
- Convertino, V. A., Armstrong, L. E., Coyle, E. F., Mack, G. W., Sawka, M. N., Senay, L. C., & Sherman, W. M. (1996). Exercise and fluid replacement position stand. *Medicine and Science in Sports and Exercise*, 28 (1), i–vii.
- Davis, D. P., Videen J. S., Marino, A., Vike, G. M., Dunford, J. V., Camp, S. P. V., & Maharam, L. G. (2001). Exercise-associated hyponatremia in marathon runners: A two-year experience. *The Journal of Emergency Medicine*, 21, 47-57.
- Hsieh, M., Roth, R., Davis, D., Larrabee, H., Callaway, C. (2002). Hyponatremia in runners requiring on-site medical treatment at a single marathon. *Medicine Science and Sports Exercise*, 34, 185-189.
- Irving, R. A., Noakes, T. D., Buck, R., Smit, V. Z., Raine, E., Godlonton, J., & Norman, R. J. (1991). Evaluation of renal function and fluid homeostasis during recovery from exercise-induced hyponatremia. *Journal of Applied Physiology*, 70, 342-348.
- O'Brien, K. (2001). Hyponatremia associated with overhydration in U.S. Army trainees, *Military Medicine*, 166, 405-410.
- Noakes, T. D. (1992). The hyponatremia of exercise. *International Journal of Sports Nutrition*, 2, 205-228.
- Noakes, T. D., Norman, R. J., Godlonton, B. J., Stevenson, D., & Pittaway, D. (1990). The incidence of hyponatremia during prolonged ultraendurance exercise. *Medicine Science and Sports Exercise*, 22, 165-170.
- O'Toole, M. L., Douglas, P. S., Laird, R. H., & Hiller, D. B. (1995). Fluid and electrolyte status in athletes receiving medical care at an ultra distance triathlon. *Clinical Journal of Sports Medicine*, 5, 116-122.
- Sanders, B., Noakes T. D., & Dennis, S. C. (2001). Sodium replacement and fluid shifts during prolonged exercise in humans. *European Journal of Applied Physiology*, 84, 419-425.
- Speedy, D. B., Faris, J. G., Hamlin, M., Gallagher, P. G., & Cambell, R. G. D. (1997). Hyponatremia and weight changes in an ultradistance triathlon. *Clinical Journal of Sports Medicine*, 7, 180-184.
- Speedy, D. B., Noakes, T. D., Rogers, I. R., Thompson, J., Campbell, R. G. D., Kuttner J. A., Boswell, D. R., Wright, S., & Hamlin, M. (1999). Hyponatremia in ultra distance triathletes. *Medicine and Science in Sports and Exercise*, 31, 809-815.
- Speedy, D. B., Noakes, T. D., & Schneider, C. (2001). Exercise-associated hyponatremia: A review. *Emergency Medicine*, 13, 17-27.
- Speedy D. B., Rogers I. R., Noakes T. D., Thompson J. M. D., Guirey, J., Safih, S., & Boswell, D. R. (2000). Diagnosis and prevention of hyponatremia at an ultradistance triathlon. *Clinical Journal of Sports Medicine*, 10, 52-58.

Effects of a Cooling Vest on Core and Skin Temperature Following a Heat Stress Trial in Healthy Males

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Abstract: The purpose of this study was to examine the effects of a cooling vest on core body temperature following active dehydration and hyperthermia induced by exercising in a hot, humid environment. Based on our study, we recommend the ClimaTech HeatShield™ only when athletes present with mild symptoms of heat exhaustion.

Fluid replacement and the prevention of heat illness have been prevalent topics in recent athletic training literature (Bailes, Cantu, & Day, 2002). Incidences of fatal collapse or heat illness in athletes have brought this topic to the forefront in the field of athletic training (Bailes et al., 2002). An inherent risk of dehydration and heat illness exists in physically active individuals, particularly when performing in hot, humid environments (Binkley, Becket, Casa, Kleiner, & Plummer, 2002). An athletic trainer's ability to recognize and manage heat-related emergencies is crucial in preventing a catastrophic event. Exertional heatstroke, the most serious heat illness, is a life-threatening medical emergency characterized by progressive weakness, fatigue, and hyperthermia (Armstrong, 2000). Elevated core body temperature is common in individuals exercising in a hot, humid environment and could potentially lead to a dangerous condition of exertional hyperthermia (Clapp, Bishop, Muir, & Walker, 2001). Numerous researchers (Binkley et al., 2002; Germain, Jobin, & Cabanac, 1987; Weiner & Khogali, 1980) have investigated the best methods of rapidly cooling core body temperature in order to determine the most effective method for athletic trainers and other health professionals to utilize in an emergency situation.

Differentiating between heat exhaustion and heat stroke is imperative in determining the proper care and management of a potentially fatal circumstance. Heat exhaustion is the most common type of heat illness (Binkley et al., 2002) and is commonly defined as the inability to continue exercise in the heat (Armstrong, 2000; Binkley et al., 2002). Heat exhaustion is characterized by pallor, fainting, weakness, dizziness, headache, and a core body temperature that ranges between 36 °C and 40 °C (Binkley et al., 2002). Heat stroke, however, can be distinguished from heat exhaustion by the presence of a dangerously high core body temperature (rectal temperature higher than 40.0 °C), or hyperthermia (Armstrong, 2000). With heat stroke, the presence of other signs and symptoms associated with organ system failure due to the hyperthermia is also evident (Armstrong, 2000).

Controversy exists regarding the most effective means of rapidly cooling hyperthermia associated with heat stroke. To date, ice water immersion is considered to be the gold standard for treating hyperthermia and heat stroke. Aside from conventional cooling methods, such as ice packs or ice water immersion, a myriad of adjunctive cooling modalities have emerged into the athletic and industrial realms. Some of these cooling methods include water spray, warm air spray, face fanning, helicopter rotary blade downdraft, whole-body liquid cooling garments, head cooling units, cooling vests, ice packs or towels, cold water immersion, and ice water immersion (Clapp et al., 2001; Clements et al., 2002; Corcoran, 2002; Costrini, 1990; Desruelle & Candas, 2000; Germain et al., 1987; Weiner & Khogali, 1980). Determining the effectiveness of these

cooling modalities is imperative in preventing a catastrophic event. Athletic trainers must remain up-to-date on current research findings on the most effective rapid cooling methods for the treatment of heat stroke as well as the effectiveness of new products on the market. The purpose of this study was to determine the efficacy of a cooling vest on core body temperature following active dehydration and hyperthermia induced by exercise in a hot, humid environment. Although participants in this study did not reach a dangerously high level of hyperthermia as is evident with heat stroke, the cooling vest was expected to rapidly reduce core body temperature as would be necessary when treating heat stroke.

Method

Research Design

The research design consisted of a randomized control design with two experimental groups. Ten participants were randomly assigned ($n = 5$) to either an experimental cooling vest (V) or a control no vest (NV) group. Dependent variables were core (rectal) body temperature, skin temperature, time to return to baseline core body temperature, percent body mass lost, urine color, urine specific gravity, and environmental conditions (ambient temperature and relative humidity). Dependent variables were measured throughout the heat stress trial and recovery periods. Potential participants reported to the Sports Science Research Laboratory at Florida International University (FIU) for a familiarization session, during which the informed consent form was read and signed and demographic information, a health history questionnaire, and baseline nude body mass were recorded. Participants were instructed to return to the laboratory at 09:30 the following day wearing an athletic supporter, mesh shorts, a cotton t-shirt, sweat socks, and running shoes. Participants were also instructed to consume a light breakfast of a bagel or toast and a small glass of juice.

Prior to the heat stress trial, participants' completely voided urine and nude body mass, urine color, and urine specific gravity data were recorded. A euhydration (normally hydrated) body mass was confirmed as less than $\pm 1\%$ (or 0.4 kg) of baseline body mass. Participants performed the heat stress trial until a $3.27 \pm .08\%$ body mass loss (mean = 67 ± 10.6 min, range = 55 - 85 min) was achieved. Throughout the heat stress trial and recovery, core body temperature and skin temperature were monitored at 5-min intervals. Following the heat stress trial, participants removed all clothing, towed dry, voided urine, and the criterion body mass loss of at least 3% was confirmed. Post-exercise urine color and specific gravity data were recorded. The recovery period consisted of dehydrated and hyperthermic (core body temperature above baseline) participants resting in a thermoneutral environment (26.6 ± 2.2 °C; 55.4 ± 5.8 % relative humidity) in either the V or the NV condition. Participants in the V group were fitted with the ClimaTech® cooling vest over a dry t-shirt and the NV group rested in their exercise clothes during recovery. At the end of the data collection session, dehydrated participants were required to orally rehydrate with cool water until they returned to within 2% of their pre-exercise body mass.

Participants

Participants were 10 healthy male volunteers (age = 25.6 ± 1.6 years, body mass = 80.3 ± 4.4 kg) recruited from FIU and surrounding community. Prior to the study, participants completed a health history questionnaire and informed consent form approved by the Florida International University Institutional Review Board. Potential participants were screened to ensure that they had no history of heat-induced illness, no chronic health problems, no orthopedic limitations, and no history of cardiovascular, metabolic, or respiratory disease within the past year. Males were selected to reduce the variability of ovarian hormone levels and

substrate utilization between genders during exercise (Cleary, Kimura, Sitler, & Kendrick, 2002). During a familiarization session the day before testing, participants were instructed not to ingest alcohol, caffeine, non-prescription medication, and avoid dehydrating behaviors (sauna, diuretics, sweat suits, etc.) for the duration of the study.

Instruments and Procedures

Hydration measures. Dehydration was determined by measuring body mass, urine color, and urine specific gravity. Body mass was measured using a digital medical platform scale (model BWB-800S, Tanita Inc., Brooklyn, NY) consisting of a digital display monitor connected to the scale platform via a 1.83 m cord. The digital medical platform scale has a body mass capacity of 200 kg with accuracy to the nearest 0.1 kg. The scale was placed on a hard, level floor and calibrated with certified weights before the data collection session. Nude body mass was verified as participants entered a private room, disrobed, and stood on the scale while the investigator read the remote display from the cord under the door. Clothed body mass was determined with participants wearing running clothes, heart rate monitor (Polar Electro Inc., Woodbury, NY) and thermistors. Nylon mesh shorts, socks, and running shoes were worn to minimize the amount of sweat trapped in the clothing. Dry mass of participants' clothes and thermistors was subtracted from the clothed mass to estimate percent body mass loss during the heat stress trial. Actual percent body mass loss was determined from the nude pre- and post-exercise body mass measurements.

Urine specific gravity was measured using a clinical refractometer (model 300CL Atago Inc., Japan). Calibration of the clinical refractometer was performed prior to the first sample following manufacturer's instructions. A urine color chart was used to determine urine concentration with closest color on the chart or half point color recorded. Urine specific gravity and urine color are considered valid and reliable indicators of urine concentration (Armstrong, 2000).

Thermoregulatory responses. Core body temperature and mean skin temperature were determined to identify the hyperthermic condition and return to the normothermic (baseline body temperature) condition. Core body temperature was measured using a rectal probe (YSI 401, Yellow Springs Instruments Inc., Dayton, OH). Skin temperature was determined using skin thermistors (model 408/708, YSI.) taped to the arm, thigh, and calf. Chest thermistors were not used since the cooling vest covering these areas would elicit an abnormally low skin temperature; thus, unweighted mean skin temperatures were calculated using only the arm, thigh, and calf data.

Heat stress trial. The heat stress trial was performed to induce dehydration and hyperthermia during exercise in a hot, humid environment. Exercise was performed on a motor driven treadmill (Proform model, Icon Health & Fitness, Logan, UT) located outside in a hot, humid, subtropical climate (mean ambient temperature = 33.1 ± 3.1 °C, range = 28.5 – 40.5 °C; relative humidity = $55.1 \pm 8.9\%$, range = 40.7 – 68.1%; and wind speed = 2.1 ± 1.1 km·hr⁻¹, range = .3 – 4.2 km·hr⁻¹). The heat stress trial commenced with a 5-min warm-up at 40% of each participant's age predicted heart rate range (mean heart rate = 131 ± 27 beats per min). Treadmill speed was then increased, and participants exercised at 60% of the age predicted heart rate range (mean heart rate = 156 ± 7 beats per min). A 60-s rest was administered every 15 min of exercise. As safety precautions, heart rate and mean arterial pressure were taken within the first 10 min of exercise; core body temperature was monitored every 5 min. Although no participant had severe hyperthermia, if core body temperature exceeded 39.0 °C, the heat stress trial was terminated.

Cooling vests. The experimental V group was fitted with a superficial cooling garment during the recovery period. The HeatShield™ cooling vest (ClimaTech Safety Inc., White Stone, VA) is a superficial cooling garment consisting of an outer shell made of Indura UltraSoft® fireproof cotton blend fabric. Beneath this outer shell lies a radiant heat reflective material, a layer of insulation, the patented synthetic ice core, and a hydrophobic quilted layer next to the body. These layers are stitched together with Nomex® thread. The cooling vest is designed for firefighters, hazardous materials teams, and mobile personnel exposed to extreme heat conditions. When following manufacturer's instructions, the HeatShield™ cooling vest can maintain a 21.1 °C environment in 37.8 °C conditions for approximately 3.5 hr.

Statistical Analysis

Statistical analyses were conducted on the hydration measures (percent body mass lost, urine color, urine specific gravity), core body temperature, arm skin temperature, and environmental conditions (ambient temperature and relative humidity) data. Pre- and post-heat stress trial differences in hydration measures were compared using separate dependent t-tests. Differences between the V and NV groups in core body temperature during the heat stress trial and recovery period were compared using separate independent t-tests. Separate 2 (V and NV) x 2 (time) ANOVAs with repeated measures on the time factor were performed for the final data collection times during the heat stress trial and recovery period for both groups. Descriptive statistics were performed for the environmental conditions measures. Data were analyzed using the SPSS 11.0 statistical package and significance was set at $P \leq .05$ for all analyses.

Results

Thermoregulatory Responses

Hydration measures. Measures of hydration status were compared between the pre- and post-heat stress trial periods. No significant differences between the V and NV groups ($t_8 = -2.030$, $P = .077$) were found on percent body mass lost data. Neither urine color ($F_{1,8} = 1.785$, $p = .218$, power = .218) nor urine specific gravity ($F_{1,8} = .010$, $p = .923$, power = .051) were significantly different between groups, but both were significantly higher (urine color, $F_{1,8} = 36.915$, $p \leq .001$, power = .999; urine specific gravity, $F_{1,8} = 6.090$, $p = .039$, power = .582) post-heat stress trial than pre-heat stress trial.

Thermoregulatory responses. Comparisons between the V and NV groups for core body temperature between 0 and 60 min of the heat stress trial revealed no significant differences between groups ($F_{1,8} = 1.785$, $p = .218$, power = .218); however, differences between tests were significant ($F_{1,8} = 138.001$, $p \leq .001$, power = 1.000). Core body temperature increased 3.3% or 1.3 °C from 0 to 60 min (37.4 ± 0.2 °C and 38.7 ± 0.2 °C, respectively) of the heat stress trial. During the recovery period, no significant differences in core body temperature between the V and NV groups were found ($F_{1,8} = .815$, $p = .393$, power = .126); however differences between tests were significant ($F_{1,8} = 166.018$, $p \leq .001$, power = 1.000). Core body temperature was decreased 2.6% or 1.0 °C from 0 to 30 min (38.8 ± 0.3 °C and 37.8 ± 0.3 °C, respectively) of the recovery period.

Potentially clinically relevant, although not significant, differences did exist during the post-heat stress trial recovery period. Specifically, the difference in core body temperature from 0 min to the end of the recovery period (mean time for return to baseline = 50.2 ± 17.05 min, range = 28 – 80 min) was 10.1% lower for the V group ($-1.29 \pm .33$ °C) than for the NV group ($-1.44 \pm .39$ °C). Although not significant ($t_8 = 1.219$, $p = .258$), the time for return to baseline core body temperature during the recovery period was 22.6% faster for the V (43.8 ± 15.1 min) group than for the NV (56.6 ± 18.0 min) group. Finally, the rate of core body temperature decrease

during the recovery period ($t_8 = .343, p = .740$) was 6.7% faster for the V ($.030 \pm .010 \text{ }^\circ\text{C}\cdot\text{min}^{-1}$) group than for the NV group ($.028 \pm .008 \text{ }^\circ\text{C}\cdot\text{min}^{-1}$).

Mean arm skin temperature comparisons were performed for the V and NV groups for the heat stress trial and recovery periods. No significant ($F_{1,8} = 5.118, p = .054, \text{power} = .390$) difference was found between the V and NV groups in mean arm skin temperature. However, mean arm temperature was significantly ($F_{1,8} = 31.623, p \leq .001, \text{power} = .998$) decreased 5.51% from the heat stress trial (mean skin temperature = $36.1 \pm 0.9 \text{ }^\circ\text{C}$) compared to the recovery period (mean skin temperature = $34.2 \pm 0.7 \text{ }^\circ\text{C}$).

Environmental conditions. The environmental conditions measured during the heat stress trial and the recovery periods were ambient temperature and relative humidity. Environmental conditions during the heat stress trial were mean ambient temperature = $33.1 \pm 3.1 \text{ }^\circ\text{C}$, mean relative humidity = $55.1 \pm 8.9\%$, and mean wind speed = $2.07 \pm 1.1 \text{ km}\cdot\text{hr}^{-1}$. During the recovery period, environmental conditions were mean ambient temperature = $26.6 \pm 2.1 \text{ }^\circ\text{C}$ and mean relative humidity = $55.3 \pm 5.8\%$.

Discussion

The purpose of this study was to examine the efficacy of a cooling vest on reducing core body temperature following active dehydration and hyperthermia induced by exercising in a hot, humid environment. Because of the various adjunctive cooling therapies available today, athletic trainers should be knowledgeable of the best clinical practice for rapidly cooling a hyperthermic athlete. Therefore, this study determined the thermophysiological impact and clinical application of a cooling vest on cooling mild hyperthermia. Both the V and NV groups had similar core body temperatures at 0 min of recovery; however, although not significant, the cooling rate for the V group was faster than the control group. The time for return to baseline core body temperature during the recovery period was 22.6% faster for the V group ($43.8 \pm 15.1 \text{ min}$) than for the NV group ($56.6 \pm 18.0 \text{ min}$). Also not significant, the rate of core body temperature decrease during the recovery period was 6.7% faster for the V group ($.030 \pm .010 \text{ }^\circ\text{C}\cdot\text{min}^{-1}$) than for the NV group ($.028 \pm .008 \text{ }^\circ\text{C}\cdot\text{min}^{-1}$). Although participants wearing the vest during recovery had reduced core body temperature in a shorter period of time than participants who did not wear the vest, the findings were not significant. Our findings did not support our hypothesis that the cooling vest would rapidly cool core body temperatures in mildly hyperthermic individuals. We conclude that the cooling vest is not as effective as the gold standard of ice water immersion in rapidly reducing core body temperature. Our study's findings support the body of evidence provided by previous studies that have demonstrated that ice-water immersion is the fastest and most effective method of reducing core body temperature in hyperthermic individuals (Armstrong, 2000; Binkley et al., 2002; Casa & Armstrong, 2003; Clapp et al., 2001; Clements et al., 2002; Costrini, 1990; Roberts, 1998; Sandor, 1997). The findings of the current study support previous studies comparing the use of a cooling garment, whole-body immersion, and torso-only immersion on 10 participants with mild hyperthermia (Clapp et al., 2001).

Although the differences between the V and NV groups in terms of core body temperature were not significant, a noticeable increase in cooling rate was observed in participants wearing the HeatShield™ cooling vest manufactured by Climatech Safety, Inc. Also, participants who wore the cooling vest during the recovery period reported positive psychological effects including a feeling of coolness and a soothing effect. These effects were also reported by Greenleaf et al. (1980) whose participants were cooled using a liquid-cooled neoprene headgear following exercise in a hot, humid environment.

Compared to other adjunctive cooling modalities, such as a whole-body cooling garment

requiring connection to a large cooling unit or source of electrical power, the HeatShield™ is more practical and easier to use. Because the HeatShield™ can maintain its cool temperature in a freezer or ice chest, it can be easily accessible or even kept on the field. Since the HeatShield™ is portable and easy to place on an athlete, it may be considered a practical cooling modality for an athlete experiencing signs of mild heat exhaustion, such as nausea, lightheadedness, and pallor. The HeatShield™ can easily be used to treat heat exhaustion at track events or other outdoor events where there is no opportunity to move the athlete indoors. The HeatShield™ would be advantageous at football events where there are no air-conditioned facilities. The athletic trainer can remove an athlete's shoulder pads and easily place the HeatShield™ on the athlete. Based on the findings of the current study, the HeatShield™ is not recommended for an athlete experiencing signs of exertional heat stroke in which elevated core body temperatures must be reduced as soon as possible.

We acknowledge there were some limitations to this study. It should be noted that our small sample size ($N=10$) was a limitation in our study. However, this is similar to Clapp et al. (2001) whose small sample size ($N=5$) resulted in an insufficient power and large effect sizes. Despite a small sample size, we were able to conclude that the cooling vest does not rapidly cool core body temperatures. For ethical and safety concerns, the extent of the heat stress trial in the current study was limited to elicit only mild hyperthermia of rectal temperatures less than 39.0 °C. Similar to findings from Clapp et al. (2001) and Clements et al. (2002), our limitation of the extent hyperthermia in our participants did not reflect the extreme conditions in which many athletes compete. The hyperthermia induced by our heat stress trial was not as extreme as that normally found in athletes with exertional heatstroke (rectal temperatures exceeding 41.0 °C) (Clapp et al., 2001). Our findings support the recommendation that the cooling vest should not be used in the treatment of heat stroke. Based on the findings of our study, we recommend using the ClimaTech HeatShield™ only when an athlete presents with mild symptoms of heat exhaustion. Ice-water immersion or alternate methods of cooling such as ice packs should continue to be considered the cooling modalities of choice when treating an athlete who presents with hyperthermia and requires rapid reduction of core body temperature.

References

- Armstrong, L. E. (2000). *Performing in extreme environments*. Champaign, IL: Human Kinetics.
- Bailes, J. E., Cantu, R. C., & Day, A. L. (2002). The neurosurgeon in sport: Awareness of the risks of heatstroke and dietary supplements. *Neurosurgery*, 51, 283-288.
- Binkley, H. M., Becket, J., Casa, D. J., Kleiner, D. M., & Plummer, P.E. (2002). National Athletic Trainers' Association position statement: Exertional heat illnesses. *Journal of Athletic Training*, 37, 329-343.
- Casa, D. J., & Armstrong, L. E. (2003). Exertional heatstroke: A medical emergency. In L. E. Armstrong (Ed.), *Exertional heat illnesses* (pp. 29-56). Champaign, IL: Human Kinetics.
- Clapp, A. J., Bishop, P. A., Muir, I., & Walker, J. L. (2001). Rapid cooling techniques in joggers experiencing heat stain. *Journal of Science and Medicine in Sport*, 4(2), 160-167.
- Cleary, M. A., Kimura, I. F., Sitler, M. R., & Kendrick, Z. V. (2002). Temporal pattern of the repeated bout effect of eccentric exercise on delayed-onset muscle soreness. *Journal of Athletic Training*, 37, 32-36.

- Clements, J. M., Casa, D. J., Knight, J. C., McClung, J. M., Blake, A. S., Meenen, P. M. et al. (2002). Ice-water immersion and cold-water immersion provide similar cooling rates in runners with exercise-induced hyperthermia. *Journal of Athletic Training*, 37, 146-150.
- Corcoran, S. (2002). Why some workers boil over wearing cooling garments—you know those cooling vests work. So why won't your workers wear them? *Occupational Health and Safety*, 71, 104-106.
- Costrini, A. (1990). Emergency treatment of exertional heatstroke and comparison of whole body cooling techniques. *Medicine and Science in Sports and Exercise*, 22, 15-18.
- Desruelle, A. V., & Candas, V. (2000). Thermoregulatory effects of three different types of head cooling in humans during a mild hyperthermia. *European Journal of Applied Physiology*, 81, 33-39.
- Germain, M., Jobin, M., & Cabanac, M. (1987). The effect of face fanning during recovery from exercise hyperthermia. *Canadian Journal of Physiology and Pharmacology*, 65, 87-91.
- Greenleaf, J. E., Van Beaumont, W., Brock, P. J., Montgomery, L. D., Morse, J. T., Shvartz, E. et al. (1980). Fluid-electrolyte shifts and thermoregulation: Rest and work in heat with head cooling. *Aviation, Space, and Environmental Medicine*, 51, 747-753.
- Roberts, W. O. (1998). Tub cooling for exertional heatstroke. *Physician and Sports Medicine*, 26(5), 111-112.
- Sandor, R. P. (1997). Heat illness: On-site diagnosis and treatment. *Physician and Sports Medicine*, 25(6), 35-40.
- Weiner, J.S., & Khogali, M. (1980). A physiological body-cooling unit for treatment of heat stroke. *The Lancet*, 1, 507-509.

A Model for Teacher Induction and Mentoring Programs

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Abstract: There is argument for differentiation between induction and mentoring programs. A basis of this paper is that both programs must coexist; that neither program can be effective without the other. Literature, data and the experiences of a novice teacher revealed components of effective mentoring/induction programs for teachers.

Even with quality teacher education programs throughout higher education, beginning teachers often feel overwhelmed, disoriented and frustrated. The one semester or less of classroom experience obtained at the undergraduate level is usually not enough to train thoroughly and properly prepare a teacher for the rigors of the first year. Besides being totally on their own in the classroom (many for the first time), teachers are also adjusting to the many nuances and idiosyncrasies of their new school. This “unwritten code” can sometimes be difficult to understand when adjusting to a new setting. Beginning teachers are often given the most difficult assignments including classes that veteran teachers are able to avoid due to seniority and having already “paid their dues”. Fortunately, many schools have developed Teacher Induction and Mentor Programs to assist teachers through this period of major adjustment; a period often referred to as “the rookie year.” The purpose of this paper is to describe a mentoring and induction program for novice teachers in a secondary school in Florida. Mentoring is the one-to-one guidance which occurs between a first year teacher and an experienced teacher, while induction is a process undertaken by a first year teacher and the school to allow the teacher to become familiar with not only the particular school, but also the teaching profession as a whole.

Method

A brief review of extant literature was explored through the use of academic and professional journals, pertinent websites, and textbooks. Additionally, experiences of a novice teacher involved in the MINT program were described. Pseudonyms for the teacher and the school are used to protect confidentiality and anonymity. This study describes the mentoring and induction experiences of a novice teacher as these experiences relate to the literature.

A Brief Review of Literature

The intent of a teacher induction program is to provide a systematic structure of support for beginning teachers (Ganser, 1996; Halford, 1998; Seyfarth, 2002). Teacher induction/mentoring programs are a must for several reasons. These programs not only ease the transition into teaching but also reduce teacher attrition and turnover while at the same time improve a teacher’s ability to teach and quality of teaching (Creating a Teacher, 2003). A teacher induction program can help new teachers improve practice, learn professional responsibilities and ultimately positively affect student learning. In addition to providing support to beginning teachers, these programs allow veteran teachers to reflect upon practice and can unite the learning community as each individual works toward the same goal - improving the quality of education. Induction programs also have the potential of elevating the teaching profession and fostering a collaborative learning community for all educators. These benefits can lead to a much higher rate of retention, as new educators find themselves in an environment that cultivates continual growth and success (Education Reform Act, 1993). Many States across the US have

regulations that link professional teaching standards, licensure and induction programs by making participation in such a program one of the requirements for the Professional License. As a result, districts need to provide an induction program to all educators in their first year of practice.

There are several components to a well-designed comprehensive induction/mentoring program. These components are: 1) A school-wide support system to guide beginning teachers. 2) A fair and honest system to evaluate and critique beginning teachers. 3) A process to allow beginning teachers to grow and develop professionally. An orientation program begins the comprehensive induction program. Opportunities are provided to learn key information about the district and school beginning with mentoring. The mentoring relationship provides the novice teacher with an opportunity to work closely with and learn from an experienced teacher. Daresh and Playko (1995) assert that the mentoring relationship is shaped by the activities that the beginning teacher and mentor participate in together. Release time is a necessary part of the mentoring relationship as it enables mentoring activities such as observation, co-teaching, and lesson planning to take place. Oftentimes, a support team is introduced in an induction program. The purpose of the support team is to link the beginning teacher with a network of veteran teachers, in addition to their mentor, that they can rely on for assistance and guidance (Education reform Act, 1993).

Mentors need to receive training in the skills of effective mentoring prior to their assignment to a beginning teacher as well as opportunities to meet with one another to share successes and trouble-shooting strategies (Education Reform Act, 1993; Nolan & Hoover, 2004). Such opportunities are an important part of professional development for the mentor. Nolan and Hoover (2004) emphasize that in order for beginning teachers to gain an understanding of their strengths and weaknesses and to grow professionally, it is important for the teacher to participate in a formal evaluation administered by a supervisor by means of clear expectations and well-defined standards and criteria (Daresh & Playko, 2004; Seyfarth, 2002). These expectations and standards of the evaluation form a "curriculum" for the joint work of the mentor and beginning teacher throughout the school year that leads to a successful mentor/induction process.

Experiences from the Front Lines

To find the importance of a mentoring program, Hank needed to look no further than his first year of teaching. He was hired as a Mathematics teacher at a Catholic high school where the first day of his "rookie year" was actually in mid-January, the start of the second semester. This was due to the fact that the teacher who started the school year had left in the middle of the first semester to take a position overseas. Between the time this teacher had departed until the time Hank came on board, for one reason or another, the students had experienced three different teachers. Hank would be the fifth teacher for these students, and it was only the midpoint of the year. This school had no induction/mentor program in place, but Hank was quite fortunate: a very experienced Mathematics teacher, Robert, was in the classroom next door to his. Robert now jokingly refers to his friendly offer to Hank of "If there is anything you need..." as the biggest mistake he ever made! This is because Hank picked his brain, asked for advice, confided/trusted in him and in general, took up quite a bit of his time. Robert showed Hank things both inside and outside of the classroom; how to plan and manage, people on campus who he should get to know (and those to avoid), how to fill out required paperwork, and how to grow professionally, and explained how policies and procedures were implemented in this school. Robert and his wife often invited Hank for dinner, showed him different parts of his new hometown, and make him feel part of the school community. Hank did not realize it at the time,

but Robert single-handedly put him through his own induction/mentoring program. To this day, Hank remains grateful for the time, knowledge, and consideration bestowed upon him by Robert. Hank often asks himself “What would have happened to me had he not ‘taken me under his wing’ in January of 1991?” Would he have stayed in education or would he have been one of the 13% of teachers who leave the teaching profession after the first year (NCES, 1992)? Or perhaps he would stick it out for another year or two before leaving, joining the nearly 30 percent of teachers who leave within the first five years (Halford, 1998). Would he have grown to love this profession the way he does? Hank believes he would have left the profession.

Hank believes that teachers who serve as mentors actually become better teachers themselves. He believes that the constant discussion, observation, and development of a professional relationship between mentor and first year teacher not only allows for professional growth of the beginning teacher but also for professional growth of the mentor as well. While serving as a mentor in the fall of 1999, he gained both insight and valuable experience as to just how time consuming (although important), demanding, rewarding, and involved it can be to serve as a mentor. Teachers grow professionally when they seek out peers for professional dialogue and turn to each other for constructive feedback, affirmation, and support (Danielson, 2002). Although this was Hank’s first experience as a mentor it was actually his second experience with the school’s mentoring program. During his first year at the school he was enrolled in the program as a beginning teacher. The school’s mentoring program is known as the MINT (*Mentors Influencing New Teachers*) program and has been in place since the early 1990’s. As with all good induction programs, this school’s program incorporates fundamentals needed by teachers during their first year (Creating a new teacher, 2003) such as:

1. Access to (directly assigned to) an experienced teacher within the same subject area.
2. Access to (and meetings with) members of the Administration.
3. Allotted time for working through the beginning teacher program.
4. School resources (substitute teachers, videotaping, etc.) available to teacher.

The MINT program actually begins during the first days of employment for the beginning teacher. Beginning teachers return to school one week prior to veteran teachers and during this time are involved in what is referred to as the “New Teacher Orientation Program”.

Teachers tour the different campuses, complete mandatory paperwork, are introduced to administrative staff, receive keys to their classroom, and begin to “settle in” to their new surroundings. Approximately one week later, when veteran teachers report, the beginning teachers are introduced to their mentor and formally begin the MINT program.

The program is divided into four parts: The pre-orientation week (as mentioned above), the on-going orientation program, the Breakfast meetings, and the New Teacher Observation Program. Hank compares the pre-orientation week to the “warm-up” phase of a long distance run: things start out somewhat slow, expectations aren’t quite clear, eagerness abounds, and everyone is fresh and “ready to go”. The on-going orientation program is, in his opinion, “the part of the mentoring program that seems to get overshadowed”. During this phase, the new teacher and the mentor sit with the following people on an individual basis: The Director of Guidance, the Dean of Students, the Dean of Faculty, the Activities Director, and the appropriate subject area Department Head (not applicable at the lower school level with self-contained classrooms). All of these meetings take place prior to November 1st of the school year, which is one reason Hank feels that this part of the program is overshadowed by the many happenings associated with the beginning of a school year. During the beginning of the year, teachers and administrators are busy and still “settling in” to the school year. Because of this, it is difficult to

block off an appropriate amount of time for a comfortable meeting instead the meeting often seems “rushed” and valuable points are not fully absorbed.

At this time of year, the Director of Guidance is already preparing Early Decision applications, the Dean of Students is reminding the students that summer break is over, the Dean of Faculty is making certain that all teachers are following through on their certification commitments, while the Activities Director is trying to remember where the school mascot was stored over the summer. All parties involved are being stretched in many directions. One excellent opportunity for ample meeting time occurs on Wednesday afternoon. The school operates a “Wednesday schedule” in which class periods are shortened and the school day, for students, ends approximately one hour early. In years past, this day was set aside for Department meetings, faculty meetings, and other presentations. However, for the last two years, the amount of faculty meetings and department meetings has been reduced. This is a direct result of teacher input and has greatly enabled teachers to have more time for planning, and most importantly, has allowed new teachers and their mentors to meet.

A favorite part of the MINT program is the “Breakfast Meetings”. During this segment of the program, new teachers and their mentors meet for one hour on assigned mornings, throughout the first three quarters of the school year, beginning at 7:00am. These meetings are held in the library, where a bountiful breakfast spread is provided. In addition, a veteran faculty member gives a presentation on a designated topic. Topics have included: lesson planning, interim reports, classroom management, the school’s academic honor code, report card comments, student assessment, effective dealing with parents, mid-term exams, and other selected topics. The best part of the breakfast meeting is seeing how the beginning teachers react and involve themselves with the veteran teachers. It is quite different than what their interaction with Administrators usually is. For some reason the teachers seem more relaxed and more willing to participate at the breakfast meetings, especially as the school year progresses. The presenters are usually teachers who have volunteered to present a specific topic at a Breakfast Meeting. Because of this, they almost always do a fantastic job. It is evident that they have put numerous hours into their presentation, although it is usually a relatively brief presentation, and the beginning teachers respond to this dedication. Three years ago Hank had the opportunity to make a presentation at a Breakfast Meeting, demonstrating several methods for grade calculation. Hank received great feedback from the beginning teachers, many expressing appreciation for “making the Math simple”. The presentation was given in mid-October which left him wondering, “What method(s) of grade calculation had the teachers been using up to that point?” He recommended to the administration that this topic should be discussed earlier in the year, perhaps even during the pre-orientation week. It is currently one of the topics covered in the pre-orientation program.

The final part of the school’s induction program is a total of twelve observations, this may seem excessive. However, this number of observations is not excessive because four of the observations are completed by the mentor teacher and are considered informal; four are completed by the Department Head and are also considered informal; two are completed by the Principal; and the remaining two formal observations are done by the Assistant to the Director. The only two observations considered to be formal observations are one each from the Principal and the Assistant to the Director. Since the majority of observations are informal, all observations are more relaxed for the beginning teacher. . Hank believes that the vast majority of beginning teachers are in need of many observations and want them. Teachers realize that the observations are being completed in order to help them to grow and develop. Observations are a

major factor in beginning teachers rating the MINT program with highest marks (Dunn, 2002). In fact, in an end-of-year survey of teachers who completed the MINT program during the 2001-2002 school year, all 44 teachers responded with a “Yes” when asked if they would recommend this program to a colleague. Additionally, over 95% of the mentors replied that they, too, would recommend the program to a colleague (Dunn, 2002).

Hank believes that the process of selection is of utmost importance. He was fortunate to have a mentor who volunteered to provide assistance. Not everyone is as fortunate; many mentors are assigned to serve this duty (Ganser, 1996). Teachers who are assigned mentoring duty are less likely to be enthusiastic (and therefore not do as good of a job) as a teacher who has volunteered to serve as a mentor. If a school is going to assign a mentor, it becomes even more important to provide necessary support to the mentor. This support comes in the form of additional time, resources, and perhaps even financial allowance. Hank would like to see a type of system that uses full-time mentors. These full time mentors would be people who have demonstrated skill with mentoring beginning teachers. Perhaps the full time mentors could have a reduced class schedule or other modifications allowing a commitment of time to this important endeavor.

Conclusions and Implications for Practitioners and Policymakers

The art of teaching seems to be a difficult field to master, especially the first year of teaching. Beginning teachers frequently receive the most difficult teaching assignments yet are expected to perform as expertly as experienced teachers. Changing legislation, philosophy, policies, and practices have resulted in dramatic shifts in the skills needed by new teachers. As a result, beginning teachers leave the field at higher rates than beginning workers in other careers.

New teachers need skills to meet the needs of special populations, to coordinate school- and work-based learning, to manage work-based programs, and to prepare students for both the workplace and postsecondary education. Policymakers and practitioners can optimize the experience of beginning teachers by facilitating activities that foster the development of collegial relationships with teacher colleagues. These activities may range from creating convenient and clear ways for understanding complex school systems and policies, to providing adequate time and resources to prepare for initial teaching assignments. It requires support not only from the local school system but also from active partners—state departments of education, outside funding sources, professional organizations, and teacher education institutions.

Teacher induction programs cannot adequately address all the problems that novice teachers might encounter (e.g., outdated equipment), but they can do much to help. These programs can improve the knowledge and competencies of beginning teachers and increase higher job satisfaction, decrease teacher turnover, and improved student achievement.

References

- Danielson, L. (2002). Developing and retaining quality classroom teachers through mentoring. *Clearing House*, 75(4), 183-185.
- Daresh, J. C., & Playko, M. A. (1995). *Supervision as a proactive process: Concepts and cases*. Prospect Heights, III: Waveland.
- Dunn, R. (2002). *Staff development and curriculum development: Analysis of faculty survey data*. Unpublished manuscript, Private Schools, Florida.
- Ganser, T. (1996). Preparing mentors of beginning teachers: An overview for staff developers. *Journal of Staff Development*, 17, 8-12.
- Halford, J. M. (1998). Easing the way for new teachers. *Educational Leadership*, 55(5), 33-35.

- Iwanicki, E. (1990). Teacher evaluation for school improvement. In J. Millman & L. Darling – Hammond (Eds.), *The new handbook of teacher evaluation* (pp. 158-171). Newbury, CA: Sage.
- National Center for Education Statistics. (1992). *Teacher attrition and migration*. Washington, DC: U.S. Department of Education. Retrieved on November 8, 2003 from <http://www.nces.ed.gov/pubsearch/pubsinfo.asp?pubid=92148>.
- Nolan, J. Jr., & Hoover, L.A. (2004). *Teacher supervision and Evaluation: Theory into Practice*. Hoboken, NJ: John Wiley & Sons.
- Seyfarth, J. T. (2002). *Human resources management for effective schools* (3rd ed.). Boston: Allyn and Bacon.

Effects of Cultural Distance on Student Socialization and Departure Decisions

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Abstract: The study examines the effects of cultural distance on student retention at an urban, Hispanic-serving university. A Cultural Distance Model based on retention research in higher education and organizational socialization theory is posed and the first half of the model is tested using path analysis with results supporting most model assumptions.

Problem and Significance

Student retention in higher education has not always been a major concern to U.S. educators or to society in general. However, social and political factors in today's environment contribute to increased interest in college student retention, both as a topic of research and as a focus for educational practitioners (Berger & Braxton, 1998). With more students attending college than ever before, student retention and graduation rates have declined since 1980, while institutional accountability and effectiveness measures are forcing university administrators to improve student graduation rates (Alexander, 2000). In response to these trends, researchers focusing on college student attrition are seeking indicators to identify potentially "at-risk" students and provide effective and timely interventions that prevent withdrawal.

To date, research has identified a growing list of potential factors influencing retention in higher education, including student, institutional and external characteristics. However, Kuh and Love (2000) maintain that retention models focus insufficient attention on interaction between student and institution, particularly the gap between a student's culture of origin and the dominant culture of the institution. This research explores that gap, referred to as "cultural distance" by Kuh and Love (2000), and its potential impact on student socialization, a key factor in student re-enrollment decisions according to Spady (1971), Tinto (1975) and others.

The study defines and tests the first portion of a retention model, called the Cultural Distance Model, which elaborates on Tinto's (1975) seminal Student Integration Model. The model includes cultural distance, a centerpiece of Tinto's model, as a possible determinant of successful social integration. Culture is broadly defined, and the model can be adapted to examine a range of student and institutional contrasts including race, ethnicity, socio-economic and first generation status, urban versus rural origins, language, and others. The model states that cultural distance, as experienced by the student upon entry to the university, affects the student's ability to socially adapt and integrate - complete the transition from outsider to insider - which in turn influences the student's decision to re-enroll. If this proposed relationship is viable, the model contributes to our understanding of why students do or do not socially integrate, which in turn provides important implications for interventions to decrease attrition.

Review of the Literature

Until Spady (1971) and Tinto (1975), student retention research focused primarily on identification of demographic characteristics of students who dropped out of school prior to completing their degree requirements. Spady (1971) introduced the notion of interaction between student and institution, noting that an individual's perception of their "social fit" was important in explaining dropout behavior. Tinto (1975) developed his seminal model of student attrition, stating that the degree to which a student was successfully integrated into the fabric of the

institution was positively correlated to the likelihood the student would persist until graduation. Kuh and Love (2000) put forth a culture-based theory of retention maintaining that the greater the distance between the student's culture of origin and the dominant culture of the institution, the greater the likelihood that the student will withdraw prior to graduation. They also state that successful cultural decoding (making sense out of the new cultural environment) through socialization helps students overcome this distance and remain enrolled.

In their book, *The Invisible Tapestry*, George Kuh and Elizabeth Whitt (1988) present an analysis of culture in U. S. colleges and universities. They state, "Because culture is bound to a context, every institution's culture is different" (p. 13). Further complicating the picture is the largely unconscious nature of cultural influences and the highly subjective interpretation of meaning that occurs even among cultural standard bearers. These factors make it nearly impossible to describe the culture of the institution objectively or to gain consensus on a specific institution's cultural description (Allaire & Firsirotu, 1984). Adding to this difficulty is the continually evolving nature of culture. Culture guides interpretation in daily interaction but is also continually being altered by it (Kuh & Whitt, 1988).

To clarify the concept of 'dominant culture,' Kuh and Whitt (1988) cite research on organizational culture, which maintains that the relative strength of a culture or subculture is impossible to define. However, according to Van Maanen and Barley (1984), a dominant culture exists and is a significant factor in the college experience. It challenges newcomers or members of under-represented groups as they enter a new environment and attempt to make sense of events and behaviors. While culture can be a stabilizer to socialization, it can also alienate newcomers who may be ignorant of cultural meaning and acceptable modes of response within that particular context. Kuh and Whitt define the dominant student culture as "the set of beliefs, attitudes and values shared by all (or most) students in a particular institution" (p. 84).

Kuh and Love (2000) liken new students to new employees, stating that both "try to understand their new environments using an interpretive scheme or sense-making system developed through experiences in their culture of origin" (p. 202). Van Maanen and Schein (1979), theorists in organizational culture and new member entry, socialization, and adaptation, describe the process new recruits in organizational settings undergo in order to make sense of the new culture and become successful insiders. Van Maanen and Schein describe socialization as "the learning of a cultural perspective that can be brought to bear on both commonplace and unusual matters going on.... the rookie must learn of these understandings and eventually come to make use of them in an entirely matter-of-fact way if he is to continue as a member of the organization" (p. 212). At its core, socialization is a teaching/learning process whereby experienced insiders interact with and educate newcomers (Van Maanen & Schein, 1979). A newcomer must begin the social integration process in order to become sufficiently socialized and continue social interaction to the degree required to make the transition from outsider to insider.

Louis (1980) developed a Model of Newcomer Experience in which organizational newcomers experience contrast between expectations based on prior experience and the realities of the new organization and its members. This contrast between the old and new is person-specific and experienced as reactions to the environment, people, and social interactions. For this reason, it is possible to measure cultural distance, not by some externally imposed criteria, but rather as students' reported their feelings. According to Louis, newcomers are faced with the arduous task of traversing cultural distance by reconstructing their own interpretive schemes utilizing an interactive process through which they internalize and interpret feedback from

external sources (sense-making). Louis, Van Maanen and Schein (1979) maintain that newcomer integration is achieved through socialization, Tinto's (1975) basic premise, but with the added insight of what must happen in the socialization process if successful entry and integration are to be achieved. With this insight, organizations can help close the cultural gap for students who may falter on unfamiliar ground.

Theories drawn from Kuh and Love (2000) coupled with time-tested retention theories of Spade, Tinto, Bean, and others parallel organizational theorists Schein, Van Maanen and Louis. Based on the nexus of these theories, an elaboration on Tinto's model of retention is proposed that includes Cultural Distance as a retention factor. This study tests only the first portion of the model responding to the following questions: (a) Do students outside the dominant culture of the institution tend to perceive a cultural distance? (b) Does this perception of cultural distance relate to students' early peer relations and satisfaction with institutional choice? and (c) Does early peer relations and satisfaction with institutional choice influence students' decision to return for the second year?

Method

Participants were selected at a large Hispanic-serving public urban university in the southern U. S. The Hispanic culture dominates the institutional culture as well as the community immediately surrounding the university. Selection of this site enabled testing of the theoretical model as it relates to non-Hispanics adapting to a predominantly Hispanic institution.

Nine weeks into the Fall 2002 semester, freshmen enrolled in the Freshmen Year Experience course were asked to complete an online survey on initial expectations, impressions of the institution, social and academic experiences, and satisfaction. Of the approximately 1400 freshman students enrolled in the class, 704 completed the survey. Only those voluntarily providing their student identification number for retention tracking purposes and completing all study-related questions were included in the sample of 575 used to test the first part of the model. A subsequent study is in progress of the full model, which includes end-of-year socialization, institutional satisfaction and intent to re-enroll. The first portion of the model was tested using 13 questions in a 56-question online survey administered to freshmen in a First Year Experience course. The survey produced a Cronbach's coefficient alpha reliability measurement of .832 based on 704 cases.

Variables

The model's first independent variable, Student Cultural Characteristics, is comprised of student characteristics to be contrasted with the culture of the institution. In this study, the hypothesized determinant of cultural distance is the students' exposure to the Hispanic culture as measured by their ethnicity (Hispanic versus Non-Hispanic) and their origin inside or outside of Miami-Dade County, FL, where the Hispanic population is 57% (US Census Bureau, 2000). Students were categorized into four subgroups: Hispanic, in County (n =299), Hispanic, out of county (n = 76), Non-Hispanic, in county (n = 81), and Non-Hispanic, out of county (n = 123).

The second independent variable, Student Perceived Cultural Distance, captures the students' sense of "fit" with the institution and was derived as a composite of four questions with a Cronbach's alpha of .65. Statements with Likert scale responses, strongly agree to strongly disagree, included: There have been times when I felt I was too different from most of the people at FIU; I have felt a sense of isolation or disconnection to the Campus community; when I am on campus I feel that I belong at FIU; and I am having problems with the language and cultural difference.

Variable three is the student's feelings of Satisfaction with Peer Relations. Two questions ($\alpha = .73$) were used: I have found other students with whom I could relate; the students I have met at FIU make me feel good about being here. The fourth independent variable, Initial Satisfaction with Institutional Choice, is measured by five (5) questions with a Cronbach's alpha of .87. Sample statements included: So far, I am happy that I enrolled at FIU; I believe that FIU was the wrong choice for me; I have sometimes felt like I was in the wrong university. The dependent variable is actual re-enrollment for the Fall Term of the student's second year, derived by checking student records in the Fall Term. Figure 1 shows the path model to be tested and the direct effect paths used for analysis.

Design and Procedure

A correlation and prediction design was selected to address the three questions. Path analysis, the most highly recommended procedure for testing attrition models (Berger & Braxton, 1998), was conducted to assess basic assumptions of the model. Path analysis assesses effects of independent variables on the dependent variable as they are mediated by intervening independent variables. In the proposed model, the effect of cultural distance on retention is theoretically mediated by the degree of successful social interaction resulting in greater sense of belonging and satisfaction. Pearson correlations and multiple regressions at $p < .05$ were used to estimate parameters of the theoretical model up to Initial Satisfaction with Institutional Choice. Due to the dichotomous final dependent variable, logistic regression is used to measure predictive power.

Results and Discussion

Beta coefficients in Table 1, which in the case of direct path regressions are the same as Pearson correlations, reveal that Perceived Cultural Distance is significantly related to Peer Relations (.47) and Satisfaction with Institutional Choice (.63). Students' Cultural Characteristics relate significantly to Perceived Cultural Distance (.20), but they have a very low and insignificant correlation to Peer Relations (-.05) and Satisfaction with Institutional Support (.04). Cultural Characteristics and Satisfaction with Institutional Choice are the only two variables significantly correlated to Return.

Results support the model's assumption that students entering an institution from outside the dominant culture are more likely to experience feelings associated with cultural distance (i.e., isolation, feelings of being different and not belonging). There are much stronger indications from the data that when students feel cultural distance; these feelings are closely related to their early peer relationships and to an even greater degree to their feelings about the institution. The low and insignificant correlations between student cultural characteristics and satisfactions with peer relations and institutional choice indicate that relationship problems or buyer's remorse relating to institutional choice should not be assumed for students coming from outside the dominant culture. High correlations are with cultural distance, not with outsider status alone.

Students in the sample population experiencing cultural distance were significantly more likely to feel they made the wrong choice of institution. These results strengthen the model's assumption that students entering the institution from outside the dominant culture who experience feelings of cultural distance are most likely to experience early difficulties with peer relationships and feel disappointed regarding their choice of institution. Interesting to note, those in the sample from outside the dominant culture who did not experience cultural distance responded to peer relations even more favorably than those from inside the dominant culture.

In the logistic regression to Return, both Student Characteristics and Satisfaction with Institutional Choice are significant in the equation, but the model's overall power to predict

return, though significant, is only 5% ($R^2 = .05$). The relatively low predictive power of the first half of the model supports the need to conduct further analysis on the role of socialization through the second half of the freshman year. Does the strong relationship between cultural distance and satisfaction with peers and institutional choice diminish through the year with continued socialization as the literature indicates? Cultural distance's insignificance in actual return supports that possibility. The study would indicate that even though cultural distance is closely related to satisfaction, other factors play a much more significant role in students' decisions to return for the second year.

References

- Alexander, F. (2000). The changing face of accountability: Monitoring and assessing institutional performance in higher education. *Journal of Higher Education*, 71(4), 411-31.
- Allaire, Y., & Firsirotu, M. E. (1984). Theories of organizational culture. *Organizational Studies*, 5, 193- 226.
- Berger, J., & Braxton, J. (1998). Revising Tinto's interactionist theory of student departure through theory elaboration. *Research in Higher Education*, 29(2), 107.
- Kuh, G. D., & Love, P. (2000). A cultural perspective on student departure. In J. Braxton (Ed.), *Reworking the student departure puzzle*. Nashville: Vanderbilt University Press.
- Kuh, G. D., & Whitt, E. (1988). *The invisible tapestry: Culture in American colleges and universities*. ASHE-ERIC Higher Education Report, no. 1. Washington, DC: Association for the Study of Higher Education.
- Louis, M. (1980). Surprise and sense making: What newcomers experience in entering unfamiliar organizational settings. *Administrative Science Quarterly*, 25, 226-251.
- Spady, W. (1971). Dropouts from higher education. *Interchange*, 2, 38-62.
- Tinto, V. (1975). Dropout from higher education: A theoretical synthesis of recent research. *Review of Educational Research*, 45, 89-125.
- U.S. Census Bureau. (n.d.). *State and county quickfacts*. Retrieved October 21, 2003, from www.quickfacts.census.gov/gfd/state/12000.html
- Van Maanen, J., & Barley, S. R. (1984). Occupational communities: Culture and control in organizations. *Research in Organizational Behavior*, 6, 287-365.
- Van Maanen, J., & Schein, E. (1979). Toward a theory of organizational socialization. In B. M. Staw (Ed.), *Research in organizational behavior* (Vol. 1, pp. 209-264). Greenwich, CT: JAI.

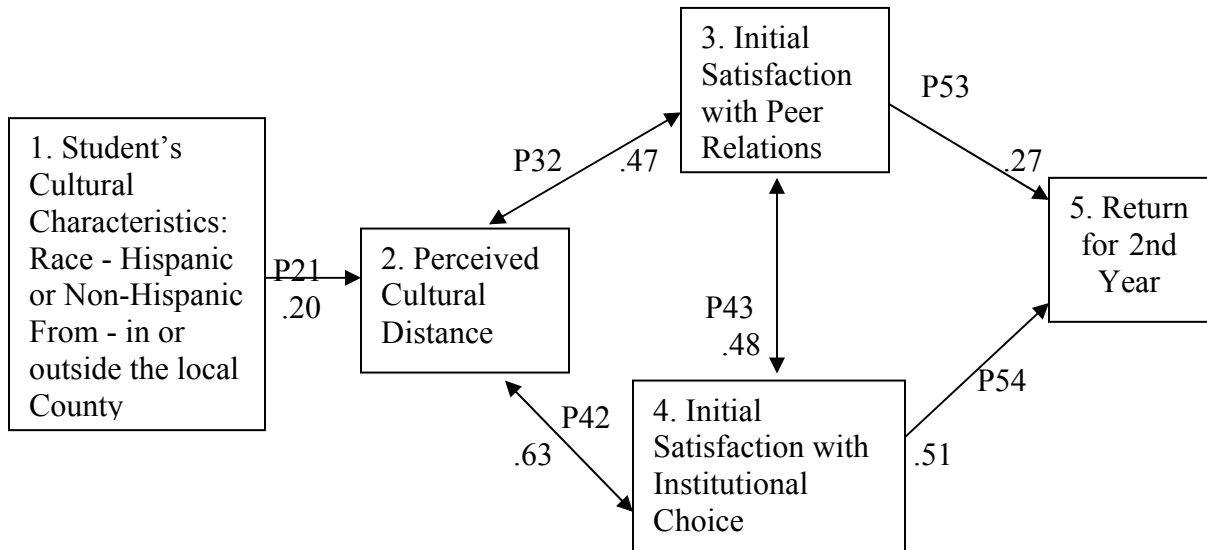


Figure 1. Path Model with Variable Correlations (N = 575)

Note: Values are Beta Coefficients for direct effects derived through multiple regressions. Betas for the final dependent variable, Return for Second Year, are calculated using logistic regression due to its binomial response. P = path designation from dependent to independent variable.

Table 1

Beta Coefficients and Regression R^2 For Path Model (N = 575)

| | Perceived Cultural Distance | Satisfaction Peer Relations | Satisfaction Institutional Choice | Return for Second Year |
|--|-----------------------------|-----------------------------|-----------------------------------|------------------------|
| Student's Cultural Characteristics | .20* | -.05 | .04 | .24* |
| Perceived Cultural Distance | | .47* | .63* | .35 |
| Satisfaction with Peer Relations | | | .48* | .27 |
| Satisfaction with Institutional Choice | | | | .51* |
| R^2 | .04* | .24* | .41* | .05* |

Note: * $P < .05$. Due to reciprocal effects, paths P32 and P43 are uncalculated in the final logistic regression of all independent variables to Return. Nagelkerke R^2 is used for regression to Return.

Class Size Reduction for the State of Florida: Is This the Solution for a Better Education?

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Abstract: Smaller class sizes have a positive impact on student achievement but Florida struggles with the problem of how to achieve smaller classes. Through a review of the literature, this paper discusses some of the programs currently used across the US, with the focus on Florida. Conclusions and implications are presented.

Class size reduction has been an issue of research and discussion since the early 1980's in American education. Researchers have conducted numerous quantitative experiments via standardized testing and qualitative studies using meta-analysis. Studies have been conducted focusing on the relationship between student achievement and class size and the impact it has on educational practices (Pritchard, 1999). The overall trend in the findings is that smaller classes would be beneficial to both students and teachers in primary grades.

The State of Florida Senate introduced Senate Bill 30-A, which addresses Class Size Reduction (CSR) and its implementation. The Bill mandates the reform to begin in the 2003-2004 school year, reducing each classroom by at least two students per year at the district level (Horne, 2003). According to a memorandum by education commissioner Jim Horne (2003), the amendment to the state constitution in Section 1, Article IX mandates final goals for the beginning of the 2010-2011 school year. The maximum number of students in core curricula courses assigned to a teacher in each of the following three grade levels is as follows: (a) Pre-K through grade 3, 18 students; (b) grades 4 through 8, 22 students; and (c) grades 9 through 12, 25 students.

The political perspective is that the state will provide funds to all districts for achieving the proposed goals of classroom reduction for the 2010-11 school year. Districts achieving their goals within the five years will be able to use the funds provided to them by the state for purposes other than classroom reduction; i.e. increasing teacher salaries, operations and capital outlay, etc.

The purpose of this research study is multifold: (a) to address issues of class size reduction in various states across the US and its effects on improving education, and (b) to investigate how these same issues are drawing concern in the State of Florida under the A+ Plan and No Child Left Behind Act (NCLB).

Method

Data were collected by reviewing memoranda and class size reduction summaries from the Florida Department of Education, executive summaries from the California's Class Size Reduction (CSR) Research Consortium, on line press releases/newspaper articles from Research Institutions on line Archives and pertinent Websites. Once these data were collected, they were placed in categories for analysis. We conducted the interrelated reliability analysis by reading and re-reading the data, and crosschecking to keep track of common themes and patterns that emerged. The following themes emerged as a result of the literature search: (a) increase in student achievement, (b) increase in instructional time and decreased discipline issues, and (c)

decrease in teaching credentials and qualifications. Each theme will be discussed in this section of the paper.

Literature Review

Increase in Student Achievement

Smith and Glass (1978) reported the results of 77 empirical studies, finding first in a meta-analysis and secondly in a later analysis that a class size of fewer than twenty promoted students' reactions, teacher morale, and the quality of the instructional environment. Since then, more recently conducted experimental studies have revealed the importance of lowering class sizes in the primary grades. Four states that are credited for their outstanding contributions in the importance of class size reduction in the primary grades are Indiana, Tennessee, North Carolina, and Wisconsin.

The state of Indiana in 1984 compared the mean scores in reading and mathematics for students in the first, second and third grades who were in classes of nineteen to twenty students. The studies revealed that students in the smaller classes improved their reading scores significantly with very little gains in mathematics (Pritchard, 1999). Using the Indiana model, Pate-Bain (1985) prompted Tennessee to "reduce student/teacher ratios and adopt the name STAR, an acronym for Student/Teacher Achievement Ratio" (HEROS, 2003).

The STAR longitudinal study has been one of the most respected experimental research studies done in modern times. It is well known for its effects lowering class size results, because it "possessed the essential features of a controlled research experiment designed to produce reliable evidence about the effects of reducing class size" (Pritchard, 1999). Some of the findings included: (a) kindergarten showed definite advantage for small classes in achievement but no significant advantage for the use of a teacher aide, (b) first grade small classes outperformed students in regular classes on standardized tests, (c) second grade small classes had significant advantages in the SAT Reading, Math, Listening, and Word Skills, and (d) third grade small classes repeated the pattern; the results were the same for all students in different locations (urban, rural, inner city, and suburban).

Increase Instruction Time, and Decrease Discipline Issues

Burke County in the state of North Carolina began a study in 1990, which was phased in as a class size reduction initiative in the 1995-96 school year. Using students in first, second, and third grade, the study found that small classes increased instructional time and decreased time dedicated to discipline issues (Egelson, Harman & Achilles, 1996). Wisconsin began the Student Achievement Guarantee in Education (SAGE) Program involving kindergarten, first, second, and third grade students from low-income families and found that discipline issues were much less and instruction time had increased significantly (CSR Research Consortium, 2000).

Decrease in Teaching Credentials and Qualifications

The State of California began its class size reduction program in 1996-97. The program's goal was to reduce the student-teacher ratio throughout the state, for kindergarten through third grade to 20 to 1 (Kirk & Ward, 2000). One great concern was that California's fourth graders had ranked 38th among 40 participating states in reading; therefore, along with the class size reduction, a reading initiative program was started (Bullwinkle & Cook, 1999). In order to guarantee the program's success, the state invested an initial \$1 billion dollars, followed by \$1.5 billion each additional year. Due to the pace at which class sizes were being reduced, the state had to hire over 23,000 teachers within the first two years, which in turn produced a new set of problems that were not foreseen. Unlike Tennessee, California had many different variables that

would affect the program, such as a larger population, overcrowding issues, a diversity of both racial and ethnic backgrounds, and an inadequate amount of physical space and teachers.

There was a decline in level of teacher preparation and experience; inequities worsened especially among poor, minority and ELL (English Language Learners) students, and an increase was obtained on the SAT-9 among students in smaller classes (Bullwinkle & Cook, 1999). Along with the California Department of Education, scientists from various educational research institutions, including American Institute for Research (AIR), RAND, Policy Analysis for California Education (PACE), WestEd, and EdSource have analyzed the Class Size Reduction Program and suggested that California needs to take care of the following issues before they continue to promote class size reductions among other grades: (a) the number of teachers with less than full credentials needs to decrease, especially since the largest number of these teachers is found in schools with poor, minority and ELL students, and (b) the program also needs to give more flexibility to districts, allowing the districts to make decisions that benefit their schools more productively (Bullwinkle & Gaylor, 2002).

In order to comply with the class size mandates within the allotted time, many districts have had to dip into their own school budgets and have been forced to cut back on programs such as music and art. Another issue is that California still has overcrowding in many of their schools due to the lack of space and funding available for classroom expansions.

Conditions Specific to the State of Florida

Florida, like California, has issues of overcrowding in their schools, specifically in Miami-Dade County, where about 41 percent of the county's schools are at 150 percent over capacity (Weaver-Dunne, 2000). Many schools have had to convert closets and teachers' lounges into classrooms. Other schools have become mini portable cities where conditions are sometimes unacceptable. The schools' population is greatly growing on a yearly basis, due to immigrant students who make up about 22 percent of the system's 360,000 students (Weaver-Dunne, 2000). Miami-Dade County cannot build schools fast enough, nor does it have the funds to do so. It was estimated that the county would need over \$1.3 billion dollars to meet its challenges.

Governor Bush in the Florida's Educational Budget proposed that 2.8 billion dollars be dedicated in addition to the funds already allocated for the state's school construction and renovation programs. This proposal supports his "Classrooms for Kids Program" (Florida's e Budget, 2003), which would help create smaller class sizes. The Governor has also proposed \$143.2 million dollars of the state's fund be allocated to recruit, retain, and provide professional development for teachers. This proposal is due to the anticipated need of nearly 192,000 new teachers (Florida's e Budget, 2003). Unlike California, the State of Florida has had a reading program since the year 2001, the *Just Read, Florida*. The program's goals are to ensure that every child can read at or above grade level by the year 2012. Along with this program, the State of Florida has had the A+ Plan for education, which the state claims "has resulted in greater student achievement, school accountability, and parental choice in deciding what education forum is best for their child" (Florida's e-Budget, 2003).

Under the A+ plan and No Child Left Behind programs, parents who have students in failing schools can take advantage of a voucher system, which helps class size reduction while providing students with a choice in their education. Students are able to relocate to another public school or attend a private school of their choice. The private schools, however, do not abide by the accountability standards that are set forth for the public school sector, nor are all private schools open to voucher students (Neas & Keenan, 2003). Like the voucher system, the

state of Florida has promoted a series of tools and options for each district to use as they try to meet the requirements of the class size reduction, Senate Bill 30A. Some of the options include introducing year round school, redrawing school attendance zones, and rescheduling classes such as double sessions. Other options are using joint facilities along with colleges and universities to promote dual enrollment courses.

Schools may choose to allow students to graduate from high school as soon as they pass the tenth grade Florida Comprehensive Assessment Test (FCAT), or schools may reduce the necessary credits for graduation from the current twenty-four. These options may assist in the downsizing of classrooms, but it creates restrictions as to which colleges students may attend. Colleges mandate that students have a well-rounded education. In essence, the state has been given an a-la-carte flexibility plan.

Conclusions and Implications for Florida Policymakers

In conclusion, small class sizes are beneficial to students, especially in the area of reading. Teachers benefit from a small classroom environment too. Teachers also benefit from having a lesser load of papers to grade, which in turn allows more time for lesson plan preparations. Many states have proven the effectiveness of class size reduction, but our state is only at the starting line. Florida has been working very hard for reform, but like California, it has many challenging issues, beginning with Florida's unique and growing multicultural population. Will our poor and minority students truly benefit from these plans, or will these minority students be somehow jeopardized?

As our state makes greater demands towards student achievement and school accountability, will our schools use funds that would enrich an entire school population to benefit only a few? In other words, will it be more important to have 22 students in an eighth grade class, and not have any funds for an enriching art class? Will we truly have all the teachers that we need, or will our state mimic California's existing situation? How will funding occur? As is, Miami-Dade County Public Schools is suffering due to misappropriations of funds. Teachers have not been given an appropriate raise in over three years throughout our state. The FCAT seems to dominate the situation by dictating which school is worthy of bonus and/or praise. It seems as though many teachers leave the profession within the first five years and students with special needs seem to suffer the most no matter what alternative is chosen. Maybe policymakers and educational administrators should promote a friendly environment that will attract corporations to the state of Florida. Promoting a symbiotic partnership between corporations and the school system is certainly something to consider where each depends on the other to produce a highly educated population. This could translate into a highly educated work force.

References

- Bullwinkle, M., & Cook, J. (1999, June). *CSR Research Consortium Press Releases Packet #1*: June 23, 1999. Retrieved on November 9, 2003, from <http://www.classize.org/press/index.htm>
- Bullwinkle, M., & Gaylor, A. (2002, June). *CSR Research Consortium Press Releases Packet #1*: February, 2002. Retrieved on November 11, 2003, from <http://classize.org/press/index-02.htm>
- CSR Research Consortium (2000, June). *Class Size Reduction in California: Executive Summary (year 2): The 1998-99 Evaluation Findings*. Retrieved on November 5, 2003, from <http://www.classize.org/summary/98-99/index.htm>

- Egelson, P., Harman, P., & Achilles, C. M. (1996). *Does Class Size Make a Difference? Recent Findings from State and District Initiatives*. Washington, DC. (ERIC Document Reproduction Service No. ED 398644)
- Florida's e-Budget (2003). *Education: Governors Priorities*. Retrieved on November 15, 2003, from <http://www.ebudget.state.fl.us/priorities/education.asp>
- Glass, G. V., et al. (1982). *School class size: Research and Policy*. Beverly Hills, CA: Sage.
- HEROS (2003, November 5). *Class Size Research*. Retrieved on November 5, 2003, from <http://www.Heros-inc.org/classsizeresearch.htm>
- Horne, J. (2003, June). *Implementation of Class Size Reduction Requirements: A Memorandum* Florida Department of Education,
- Kirk, P. J., & Ward, M. E. (2000, August). *Evaluation Brief: Update on Class Size Research Since 1998*. Public Schools of North Carolina, State Board of Education. Retrieved on November 11, 2003, from <http://www.ncpublicschools.org/Accountability/evaluation/evalbriefs/vol2n6c98.htm>
- Lazear, E. P. (2000). *Smaller Class Size No Magic Bullet*. Hoover Institution: Hoover Digest 2000 No.1. Retrieved on November 5, 2003, from <http://www-hoover.stanford.edu/publications/digest/001/lazear.html>
- Neas, R. G., & Keenan, N. (2003). *Vouchers and the Hidden Agenda*. Retrieved on November 9, 2003, from <http://www.pfaw.org/pfaw/general/default.saspx?oid=12108>
- Pritchard, I. (1999). *Reducing Class Size: What Do We Know?* Archived Information, National Institute on Student Achievement, Curriculum and Assessment: US Department of Education. Retrieved on November 9, 2003, from <http://www.ed.gov/pubs/ReducingClass/title.html>
- Weaver-Dunne, D. (2000). *School Issues Article: Florida Fails Children of Miami-Dade County*. Education World, Copyright 2002. Retrieved on November 11, 2003, from http://www.education-world.com/a_issues/issues107.shtml
- Word, E. (1990). *The State of Tennessee's Student/Teacher Achievement Ratio (STAR) Project: Final Summary Report 1985-1990*. Retrieved on November 5, 2003, from <http://www.heros-inc.org/classsizeresearch.htm>

Voluntary, Chronic Dehydration in Adolescent American Football Players

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Abstract: The purpose of the study was to determine whether voluntary acute or chronic dehydration occurs in a male adolescent athletic population during twice-a-day American football practice sessions. We conclude that participants will voluntarily rehydrate themselves between practice sessions and will begin to acclimate within three to four days.

Heat illness appears to be increasingly more common in youth sport participants, perhaps because of the increasing numbers of children and adolescents participating in sports and increased duration and frequency of practice and games. Heat illness is a collective term for exertional illness resulting from exercising in the heat including heat cramps, heat exhaustion, and heat stroke (Armstrong, De Luca, & Hubbard, 1990; Casa, 1999; Rich, 1997). Classically, heat cramps are disabling muscular cramps--most often in the legs or abdominal wall--in an athlete with normal body temperature, clear sensorium, and normal blood pressure (Eichner, 1998). Heat exhaustion is the most common form of heat illness and is defined by the inability to continue exercise in the heat (Lee, 1990). Heatstroke is a medical emergency which can lead to death (Hart et al., 1982) and is usually associated with hypovolemic shock and extreme hyperthermia. Coaches, parents, and athletic trainers should be vigilant in providing precautionary measures including continuous rehydration and in being watchful for signs of heat illnesses.

Adolescents and youth sport participants are at greater risk for heat illness (heat cramps, heat exhaustion, and heat stroke) than adults because they are less efficient thermoregulators (Allen & Overbaugh, 1994). Further, adolescents are more active than adults and spend more active time outdoors (Bar-Or, Dotan, Inbar, Rotshtein, & Zonder, 1980), often in high ambient temperatures and relative humidity increasing thermoregulatory strain and fluid loss. Compared to adults, youths have a larger surface area-to-mass ratio allowing more heat to be absorbed from the environment (Bar-Or, 1989). Youths also have higher metabolic heat production during walking and running, lower cardiac output for any level of oxygen uptake, and a lower ability to perspire (Bar-Or, 1997). Fluid deficits are common as adolescents tend to voluntarily dehydrate while exercising in hot environments even when adequate amounts of fluid are readily available (Bar-Or et al., 1980; Bar-Or et al., 1992).

For ethical reasons, no studies have examined the responses of children's core temperature, other physiological responses, or perceptual functions to hypohydration of more than 3% initial body weight (Bar-Or et al., 1997). The relative ease of ingesting fluids and collecting data has resulted in most research having been conducted on stationary cycle ergometers inside controlled climate environmental chambers (Millard-Stafford, 1992). Research conducted in real life or *in vivo* settings may provide valuable information on adolescents' responses to exercise in the heat. Chronic dehydration may result from voluntary dehydration of adolescent athletes participating in repeated strenuous practice, such as twice-a-day American football practice. Adolescent American football players may be unlikely to rehydrate adequately and may become voluntarily dehydrated between practices on the same day (acute dehydration) or between days of practice (chronic dehydration). The purpose of the study was to determine

whether voluntary acute or chronic dehydration occurs in a male adolescent athletic population during twice-a-day American football practice sessions.

Methods

Participants

Twenty-nine healthy adolescent male American football players 12 - 17 years old (age = 14.5 ± 2.5 yr, height = 174.5 ± 14.5 cm, weight = 92.7 ± 42.1 kg) were recruited from an all boys South Florida preparatory school to volunteer for this study. Males were selected because this is the population participating in tackle football and to reduce the variability of hormone levels and substrate utilization between genders during exercise. Prior to participation on the football team, a physician administered a pre-participation physical examination to all athletes. Health, injury history, and physical activity questionnaires and informed consent forms were read and signed by participants and parents/guardians in compliance with Florida International University's (FIU) Institutional Review Board (IRB) policies. Participants were instructed to continue with regular eating and drinking habits during the two weeks the study was conducted.

Procedures

A familiarization session was conducted in the school's athletic training room during which signed informed consent forms were collected and the primary investigator familiarized participants with testing procedures. All instruments used throughout the study were shown to participants and a demonstration on the use of each instrument was performed. During this session, baseline anthropometric and demographic data were collected. At the conclusion of the familiarization session, participants ($N = 29$, 21 with complete data) were assigned an identification number for confidentiality purposes.

Participants reported to the athletic training room 30 min prior to the beginning of each practice session for data collection. Practice sessions consisted of typical high school American football activities for approximately 2.5 hours for each session during the first two weeks of August in South Florida. Varsity level participants practiced twice a day for four days, with one morning practice session from approximately 9:00--11:30 am and one afternoon practice session from approximately 2:00--4:30 pm. Varsity also held three once-per-day practice sessions, one in the morning and two in the afternoon. Junior varsity level participants practiced for eight days, with one afternoon practice session per day from 2:00--4:30 pm. The first two days of practice for varsity level consisted of shorts only practice sessions (t-shirt, shorts, helmet, socks, and cleats). Following these two days, all practice sessions consisted of the participants wearing full American football equipment (helmet, shoulder pads, t-shirt, padded pants, jersey, socks, and cleats). During each practice session, volume of fluid consumed was recorded during rest breaks regularly scheduled every 15 - 30 min, or as needed. Participants reported to the athletic training room within 30 min of the end of each practice for post-exercise data collection.

Instruments and Testing Procedures

Anthropometric measurements. Body mass was measured to the nearest 0.1 kg using a Tanita BWB-800S digital scale (Tanita Inc., Brooklyn, NY). The scale was placed on a level, hard surface and prior to each session was calibrated using certified weights (Champion Barbells, Dallas, TX). Height was assessed using a metric tape measure (Sears Roebuck & Co., Hoffman Estates, IL) attached to the wall. The height measurements were recorded to the nearest 0.1 cm with each participant barefoot and standing erect with scapulae, buttocks, and calcanei touching the wall.

Hydration status. Hydration status consisted of body mass differences, urine volume, and urine concentration. Body mass was measured as participants disrobed in a private stall with the

scale connected via electronic cord attached to a remote digital display located at the investigator's position outside of the private weighing area. Body mass determinations consisted of towel drying sweat from skin and hair as participants stepped on the scale. Body mass was measured by the investigator using the remote digital display. Throughout practice sessions, the volume of fluid consumed was recorded.

Environmental monitoring. Ambient temperature and relative humidity were measured using a digital temperature humidity monitor (Model PTH8709K, Linseis Inc., Princeton, NJ) calibrated each day prior to the practice sessions using calibration salts and following the manufacturer's instructions. Wind speed was measured using a Kestrel 3000 environmental meter (Richard Paul Russell Limited, Lymington, UK), which is a combined electronic anemometer, thermometer, and hygrometer.

Statistical Analysis

Independent variables were: Day (Day 1 and Day 2) and test (pre-practice and post-practice). The dependent variable was hydration status as measured by body mass. Repeated measures ANOVAs were performed on the dependent variable and when significant interactions existed, tests of simple main effects were performed. Descriptives were calculated for the volume of fluid consumed data. Data were analyzed using the SPSS 11.0 Statistical Package and significance was set at $P < .05$ for all analyses.

Results

Measures of hydration status (body mass) were compared before and after two consecutive American football practice sessions; two practices on one day (Day 1 am and pm) and Day 2 am only. The complete ($n = 12$) body mass data sets (pre- and post-practice for Day 1 am, Day 1 pm, and Day 2 am) were analyzed using repeated measures ANOVA. Body mass data revealed significant ($F_{5,55} = 11.656$, $P \leq .001$, power = 1.00) differences during and between practice sessions. *Post hoc* testing revealed that body mass became significantly ($P = .029$) reduced 1.18% (1.0 kg) during the first morning practice. Body mass was also significantly ($P = .01$) reduced 1.55% (1.3 kg) between the Day 2 post-practice measurement compared to the first measurement (Day 1 pre-am practice). Between the morning and afternoon practices on the first day, body mass was significantly ($P = .001$) increased 1.67% (1.4 kg) however, during that afternoon practice, body mass was again significantly ($P < .001$) reduced 1.30% (1.1 kg). Body mass did not significantly change between days of football practice but, by Day 2 pre-practice, body mass was significantly ($P = .001$) reduced 2.11% (1.8 kg) compared to pre-practice the afternoon prior. Finally, body mass was significantly ($P \leq .001$) reduced 1.15% (1.0 kg) during practice on the second day. Average fluid consumed over the three consecutive practice sessions was 1772.8 ± 158.4 mL per practice (range = 1304.2 – 2093.0 mL). No other data sets were analyzed at this time.

Discussion

Results of this study demonstrate that when allowed to drink water *ad libitum*, adolescents voluntarily chronically dehydrate while participating in twice-a-day American football practice. From the beginning of each practice until its conclusion, every participant demonstrated a decrease in body mass indicating loss of body fluid. Body mass measurements were chosen because this is considered by most researchers to be the gold standard of measuring dehydration (Armstrong, De Luca, & Hubbard, 1990; Casa, 1999; Rich, 1997). During the approximately three hour rest period between morning and afternoon practice sessions body mass data revealed that participants adequately rehydrated and did not become acutely dehydrated. Overall, the pre-afternoon practice body mass measurements exceeded the post-

morning body mass measurements. We expected an increase in body mass overnight with adequate time to rest and digest indicating rehydration. However, when allowed to rest overnight, overall body mass measurements were not significantly different from post afternoon body mass measurements, indicating that participants became chronically dehydrated when they did not adequately rehydrate given an entire night (approximately 15 hours) to rest and consume fluids.

Exercise in the hot, humid conditions during the summer months in South Florida combined with heavy football equipment can lead to dehydration. The American football equipment in this study weighed an average of $6.46 \pm .94$ kg, provided additional weight to carry, and covered large amounts of skin. Athletes have difficulty dissipating heat, as sweat cannot evaporate from covered skin (McCullough & Kenney, 2003). An American football uniform has been shown to significantly increase the risk of dehydration by imposing a heat loss barrier (Matthews, Fox, & Taizi, 1969). Under the American football uniform skin temperature, cutaneous vasodilation, and peripheral blood flow have been demonstrated to increase, reaching near maximal levels. Heart rate and body mass loss also increased as a result of the uniform, which made evaporation and heat loss from the underlying surfaces almost impossible (McCullough & Kenney, 2003). Based upon our findings, the environmental conditions combined with exercise while wearing football equipment, even when fluid was freely available, lead adolescents to dehydrate during a single practice session.

Although our participants had increased body mass between pre morning measurements and pre afternoon measurements, this may not truly represent rehydration. The composition of fluid consumed at rest is extremely important in gastric emptying rate while attempting to rehydrate during a short period of time, as in the current study. We administered a relatively short period (about 3 hours) between practice sessions on the same day, which may have lead participants to feel the need to consume as much fluids and foods as possible during this time. Because of the short amount of time, however, the food and fluids consumed probably had not been absorbed into the bloodstream resulting in extra body mass that did not provide any actual rehydration (Melin et al., 1994; Rehrer, Beckers, Brouns, ten Hoor, & Saris, 1989). Voluntary rehydration typically occurs when ample time is provided for consumption of fluids; however, although our participants did consume food and fluids between practices, the fluids probably had not left the gastrointestinal tract in time to benefit the participants during the afternoon practice session.

Adolescents voluntarily dehydrate even when allowed to drink freely (Bar-Or et al., 1980; Bar-Or et al., 1992; Meyer, Bar-Or, Salsberg, & Passe, 1994; Wilk & Bar-Or, 1996). Voluntary dehydration appears to occur in hot, humid conditions because thirst is an inadequate stimulus for drinking (Ladell, 1965). Although drink composition and flavor have been shown to prevent voluntary dehydration and decrease the risk of dehydration (Meyer et al., 1994), it is important to continuously monitor adolescents' body mass and fluid consumption during exercise since core body temperature can increase $.28^{\circ}$ C for every 1% body weight lost when dehydrated (Bar-Or et al., 1980). When exercising in the heat, adolescents do not adapt as effectively as adults for morphological and physiological reasons (American Academy of Pediatrics, 2000). Adolescents produce more metabolic heat per body mass unit than adults (Astrand, 1952), have a greater surface area to body mass area than adults (American Academy of Pediatrics, 2000), and may have a lower sweating capacity than adults (Bar-Or, 1989), making adolescents more susceptible to dehydration and heat illness than adults. Dehydration results in an almost immediate decrease in physical output (Sawka, 1992). With evaporation being the

primary mechanism of heat dissipation during exercise (American Academy of Pediatrics, 2000), it becomes critical to carefully monitor adolescent athletes when participating in full football equipment. Since adolescents' thirst and thermoregulatory mechanisms are inefficient, voluntary dehydration in adolescents may have more serious consequences when compared to adults.

The dangers of adolescents and dehydration have been clearly defined. While participating in any type of sport, it is very important to prevent dehydration which becomes even more difficult with individuals practicing while wearing American football equipment. The tradition of two practices a day for several consecutive days usually in hot and humid conditions of August creates a very dangerous situation for adolescents in particular. Importantly, athletic trainers must closely monitor every athlete under their care participating during two-a-day practices. With the increased intensity and frequency of practices, even overnight may not be enough to ensure adequate rehydration. Continuous consumption of fluids before, during, and after every practice session is critical to prevent chronic, voluntary dehydration.

References

- Allen J. G., & Overbaugh, K. A. (1994). The adolescent athlete, part III: The role of nutrition and hydration. *Journal of Pediatric Health Care, 8*, 250-254.
- American Academy of Pediatrics. (2000). Climatic heat stress and the exercising child and adolescent. *Pediatrics, 106*(1), 158-159.
- Armstrong, L. E., De Luca, J., & Hubbard, R. (1990). Time course of recovery and heat acclimation ability of prior exertional heat stroke patients. *Medicine and Science in Sports and Exercise, 22*, 36-48.
- Astrand, P. O. (1952). *Experimental studies in physical working capacity in relation to sex and age*. Copenhagen, Denmark: Munksgaard.
- Bar-Or, O. (1989). Temperature regulation during exercise in children and adolescents. In C. Gisolfi, & D. R. Lamb (Eds.), *Perspectives in exercise and sports medicine, II: Youth, exercise and sport* (pp. 335-367). Indianapolis, IN: Benchmark Press.
- Bar-Or, O., Barr, S., Bergeron, M., Carey, R., Clarkson, P., Houtkooper, L., Rivera-Brown, A., Rowland, T., & Steen, S. (1997). *Youth in sport: Nutritional needs, 8*(4), RT #30.
- Bar-Or, O., Blimkie, C. J. R., Hay, J. H., MacDougall, J. D., Ward, D. S., & Wilson, W. M. (1992). Voluntary dehydration and heat tolerance in cystic fibrosis. *Lancet, 339*, 696-699.
- Bar-Or, O., Dotan, R., Inbar, O., Rotshtein, A., & Zonder, H. (1980). Voluntary hypohydration in 10 - 12 year old boys. *Journal of Applied Physiology 48*(1), 104-108.
- Casa, D. J. (1999). Exercise in the heat, II: Critical concepts in rehydration, exertional heat illnesses, and maximizing athletic performance. *Journal of Athletic Training, 34*, 253-262.
- Eichner, E. R. (1998). Treatment of suspected heat illness. *International Journal of Sports Medicine, 19*, S150-S153.
- Hart, G. R., Anderson, R. J., Crumpler, C. P., Shulkin, A., Reed, G., & Knockel, J. P. (1982). Epidemic classical heat stroke: clinical characteristics and course of 28 patients. *Medicine (Baltimore), 61*, 189-197.
- Ladell, W. S. S. (1965). Water and salt (sodium chloride) intakes. In O. Edholm & A. Bacharach (Eds.), *The physiology of human survival* (pp. 235-289). New York: Academic.
- Lee, R. P. (1990). Severe heat stroke in an experienced athlete. *Medical Journal of Australia, 153*(2), 100-104.

- Matthews, D. K., Fox, E. L., & Taizi, D. (1969). Physiological responses during exercise and recovery in a football uniform. *Journal of Applied Physiology*, 26(5), 611-615.
- McCullough, E., & Kenney, W. L. (2003). Thermal insulation and evaporative resistance of football uniforms. *Medicine and Science in Sports and Exercise*, 35(5), 832-837.
- Melin, B., Cure, M., Jimenez, C., Koulmann, N., Savourey, G., & Bittel, J. (1994). Effect of ingestion pattern on rehydration and exercise performance subsequent to passive dehydration. *European Journal of Applied Physiology*, 68, 281-284.
- Meyer, F., Bar-Or, O., Salsberg, A., & Passe, D. (1994). Hypohydration during exercise in children: Effect on thirst, drink preferences and rehydration. *International Journal of Sports Nutrition*, 4, 22-35.
- Millard-Stafford, M. (1992). Fluid replacement during exercise in the heat: review and recommendations. *Sports Medicine*, 13(4), 223-233.
- Rehrer, N., Beckers, E., Brouns, F., tenHoor, F., & Saris, V. (1989). Exercise and training effects on gastric emptying of carbohydrate beverages. *Medicine and Science in Sports and Exercise*, 21, 540-549.
- Rich, B. (1997). Environmental concerns: heat. In R. E. Sallis & F. Massimino (Eds.), *Essentials of sports medicine* (pp. 129-133). St. Louis, MO: Mosby.
- Sawka, M. N. (1992). Physiological consequences of hypohydration: Exercise performance and thermoregulation. *Medicine and Science in Sports and Exercise*, 24, 657-670.
- Wilk, B., & Bar-Or, O. (1996). Effect of drink flavor and NaCl on voluntary drinking and hydration in boys exercising in the heat. *Journal of Applied Physiology*, 80, 1112-1117.

School Efficacy and Educational Leadership: How Principals Help Schools Get Smarter

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Abstract: Schools become learning communities when both teachers and students exert extraordinary commitment and performance. When shared leadership between administrators and teachers is fostered, students benefit academically. This is called *school efficacy*. In this action-research paper, two principals in low-performing, high-poverty urban schools share their recommendations for fostering higher student achievement, making their respective schools smarter.

Schools work best when students engage in robust learning. Robust learning is a condition in which students can easily navigate around the content area and begin to frame their own inquiry questions about the discipline. Robust learning occurs in a school climate of extraordinary commitment and performance (Sergiovanni, 2001) on the part of both teachers and students. Of course, this kind of learning community is a paradigm. How do schools become learning communities? One way is by creating higher achieving schools, called school efficacy, through collaborative problem solving (Tschannen-Moran, Uline, Woolfolk-Hoy, & Mackey, 2000).

Purpose

This paper will take a snapshot of the educational philosophies of two principals: one, an experienced urban high-school leader; the other, a less experienced urban elementary-school leader. Both administer low-performing, inner-city schools. Both are trying to make their respective schools smarter through the development of discourse communities among teachers (Tschannen-Moran et al., Uline, 2000) and shared leadership processes between teachers and administrators.

Conceptual Framework

School efficacy is another name for smarter schools. It derives from two other established constructs in cognitive psychology: *self-efficacy* and *teacher efficacy*. *Self-efficacy* is a person's belief in his/her ability to overcome the difficulties inherent in performing a specific task in a particular situation (Bandura, 1982), e.g., learning how to drive a car. *Teacher efficacy* is a belief or conviction a teacher has that he or she has the capacity to positively affect student engagement and learning, even among those students who may be difficult or unmotivated (Bandura, 1977). School efficacy is an extension of an educational psychology definition usually applied to a person, now being associated with an organization.

Standing as a bridge between *teacher efficacy* and *school efficacy* is the concept of *collective efficacy*. *Collective efficacy* is the intentional, coordinated, and effective interactions of administrators, teachers, and students which results in students working with more intensive focus and responsibility and teachers working with increased clarity on the school's mission (Goddard & Goddard, 2001).

Following the findings of pioneer learning theorists Lev Vygotsky and Jean Piaget, new understandings of cognitive development stress the social nature of knowledge.

Knowledge learned in isolation often remains inert, whereas knowledge learned in social situations is both contextualized, and, to varying degrees, transferrable by the learner to new problem-solving situations. However, the learning of complex subject matter or the flexible adaptation of knowledge to new problems and settings takes time.

Lambert (1995) gives us a definition of “constructivist leadership” which is applicable to *school efficacy*: “. . . leadership as involving a reciprocal process that enables members of a school community to construct meaning that leads toward a common purpose . . . building capacity among people and in schools” (as cited in Sergiovanni, 2001, p. 157). Rost (1991), too, defines leadership as “. . . an influence relationship among leaders and followers who intend real changes that reflect mutual purposes” (as cited in Sergiovanni, 2001, p. 157). In both of these definitions, the roles of followers and leaders are intertwined and often blurred. Effective leadership entails shifting back and forth between the roles of leader and learner without discomfort, as situations often evolve in complex school organizations.

Let us look then at the vision, perspectives, and thoughts of two different inner-city principals in very challenging urban settings as each leader attempts to improve his school by making it smarter through the development of teacher discourse communities.

Method

This paper takes a qualitative, ethnographic approach (Wolcott, 1994) to viewing two urban, inner-city principals: one, an experienced high school leader; the other, a less experienced elementary school leader. Data were collected through two focused interviews. Eleven questions were asked of the high school principal; eight questions were posed to the elementary school leader. Each interview lasted approximately three-quarters of an hour. The interviews were conducted in Spring 2003 at the respective school sites. The framework for the interview responses to questions was a *Change Facilitator Style Inventory (CFSI)*, developed by Hall & Rutherford (Sergiovanni, 2001, p. 339). The CFSI includes seven behaviors. The responses are categorized as fitting within five of the seven behaviors on the inventory. The principals are identified as Principal A, high school; and Principal B, elementary school.

Findings

Two principals exhibit extensive inner-city education experience.

Brief Biographies of the Principals

Principal A. I graduated from segregated public schools. I attained a B.A. and a Masters in English Education. I was hired in 1971. I was a language arts teacher for eight years. Then I was a guidance counselor for eight years, the last two as guidance chair. In 1987 I was appointed to my first position as an assistant principal in opening a new magnet school. In 1991 I was appointed as the AP for curriculum and instruction at a traditional high school in the inner-city. In 1992 I was hired as the principal of a middle school in the inner-city. In 1995 I was appointed the principal of a very large inner-city high school. In 1998 the Superintendent asked me to take my present position. This is my fifth year.

Principal B. I went through public schools. I then went to the local community-college. After that I transferred to a four year university, graduating with a B.A. in education. I got my Masters with a specialist degree and certificates in ESOL, Gifted, and Educational Leadership. I taught ten years at an inner-city elementary school. I was an AP at a different inner-city elementary school for the next six years. I have been the Principal at my current elementary school assignment for the last two years.

Vision

In inner-city schools, socialization must be established before intellectual purpose can be realized in a classroom setting. The principals talked about how relationships—between teachers, and between teacher and student—were important ingredients to creating a climate for learning.

Principal A. The flavor of the school I would not change...We have a pretty balanced population ethnic-wise...we have all the sub-groups represented - except we don't have a whole lot of white students....Even though the school is in a 'tough' neighborhood, the kids seem to accept differences in other kids much better than at some schools. Our built-in alumni are really interested in our school, and that is a strength. I am about changing cultural mentalities and expectations which too easily accept mediocrity. The biggest roadblock to achievement in this school is not being here! You have to learn how to grow as a team.

Principal B. I would never change the teachers that we have here. I wouldn't change the history either. The school is over 50 years old. We feel good - take pride in being in this community. ...I stress to teachers that we are going to take the kid where he/she is at and work with them - try to meet all their needs - move them forward.When you start collaborating you allow the teacher to be empowered. The teachers here could teach anywhere....It's the people who make a school and the principalship sets a tone for the building....'We're all in this together.'

Structuring the School as a Workplace

Students in inner-city schools need to develop study habits and patterns so that they can build persistence in doing intellectually challenging work. Students respond positively to reading, writing, and thinking tasks that challenge them when teachers establish daily reading, writing, mathematics and science habits.

Principal A. We have had an attendance problem at this school, and it's the biggest roadblock to achievement. But, it's more than what's happening at home....it's a mentality that says, 'we can do a lot of things that are more important than school; eventually we'll get to school.' This is a cultural mentality. We need to change the culture. A danger in a struggling school is the teacher who gets in a rut: 'These kids can't; they didn't really know this, so I can't start that.' I tell teachers: do not teach to the lowest level in your class; raise those expectations!

Principal B. What we have to do is make everyone accountable. On the other hand, I don't think one grade should make or break a kid - one test - I don't see that at all. But teachers need to be looking and monitoring as never before so that the gap won't get so big. To do well in inner-city teaching, it is not a matter of lack of intelligence. It is being able to relate to the environment and the kids. Even the most ineffective teachers, if you set goals for them, they will step up to the plate.

Structuring Involvement with Change

Effective teachers love to teach. Anything other than instruction is often seen by teachers as a distraction. Shared decision-making and governance works best when teachers feel they are involved with change from its inception, not included in planning and decision-making after direction has been started unilaterally,

Principal A. I walk around the school a lot; as an administrator you cannot sit down and plan your day like a teacher; you're always leaving spaces to deal with people....I'm the person who ties things all together so I have to know when to give some and when to take some: with parents, teachers, APs, and students...but you turn things over to key people and meet with them periodically....I don't expect to continue to do the same thing and expect the same result.

Principal B. You want, as a principal, to empower your teachers so that they will carry on whether you are here or not....We need to build in motivation for teachers to become quality teachers....the bottom line is this: if you are fair, if you are a fair leader, people are going to follow you.

Sharing of Responsibility

Sharing responsibility is an ambiguous, complex and uncertain process. Not every teacher has leadership skills nor wants to take on leadership responsibility. Likewise, teacher leadership has many different definitions.

Principal A. You can't run the school by yourself. You start the job thinking everything has to be in your hands - because you are responsible. Where I have grown is in delegation - letting go of things. You need to turn things over to key people and meet with them periodically. Everybody has some weaknesses - me included. When someone has a strength, you work with them on their weaknesses. Sometimes you put up with it for the results you get from what they do that they are strong in. In working with people, you have to wait to see if they recognize they have a need.

Principal B. The best possible scenario is that I motivate the troops, and then the teachers grow and the kids grow. Universities should be placing more student-teachers in inner-city schools for the experience. The teaching jobs are in the inner-city. Anyone who sits in my chair and is on a power trip will have serious problems because people will see right through that! The hardest thing I've had to learn as a principal is to 'let go' - the more you allow people to serve, the more power you have, and the more you learn as a person.

Decision Making

Principals and teachers must adapt to change as a daily, flexible occurrence for school efficacy to thrive.

Principal A. My basic philosophy is that kids need structure, so if you do things by example you can help students.... You have to adjust everything to fit the people in the building.... Being able to build a team only comes with experience. It does not come naturally.

Principal B. I just see myself as a little wiser. I try to keep 'high energy,' sit back and reflect: 'how can I do better.' I can never get on a high horse. There is always room for improvement.

Conclusion and Educational Implications

The two principals can be seen as *learning* leaders rather than *instructional* leaders (Dufore, 2002). They are principals who focus on advancing student and staff learning. They increase the knowledge the school possesses as an organization through collaboration of staff. Several implications flow from these observations in a time when many complain that the public schools are a bureaucracy that nurtures a culture of inertia.

Leadership Excellence Means Striving to be Innovative

A principal should be a risk-taker. This stance will likely threaten someone, somewhere in a position of political power within the school system. On the other hand, doing what is necessary to get ahead will probably entail implementing procedures as faithfully as possible so as to stay out of trouble. (Thernstrom & Thernstrom, 2003, p. 255).

Raising Student Academic Achievement Means Emphasizing Success

The credentials roadmap for principals to attain licentiateship tends to emphasize procedures rather than performance. Principals should become more entrepreneurial in their outlook about leadership and less afraid of accountability in terms of connecting their performance to the achievement of their students (Thernstrom & Thernstrom, 2003, p. 255).

School-site Administrators Should Exercise More Autonomous Leadership

Regional and central office bureaucracies tend to squelch the creative impulses of school-site administrators and prevent them from emerging. As it is, school principals have less control over their staffs, resources, and discipline policy than they have ever experienced (Thernstrom & Thernstrom, 2003, p. 255).

References

- Bandura, A. (1982). Self-efficacy: mechanism in human agency. *American Psychology*, 37, 122-147.
- Bandura, A. (1977). Self-efficacy: Toward a unifying theory of behavioral change. *Psychological Review*, 84, 191-215.
- Dufore, R. (2002). The learning centered principal. From *Beyond Instructional Leadership*, 2002, May. In *The Best of Educational Leadership 2001-2002*, 36, Arlington, VA: Association for Curriculum and Supervision.
- Goddard, R., & Goodard, Y. (2001, April). An exploration of the relationship between collective efficacy and teacher efficacy. Paper presented at the annual meeting of the American Education Research Association.
- Hall, G. E., & Rutherford, W. L. (1983, April). Three change facilitator styles: How principals affect improvement efforts. Paper presented at the annual meeting of the American Educational Research Association, Montreal, Canada. In T. Sergiovanni (2001). *The principalship: A reflective practice perspective*. Boston: Allyn & Bacon.
- Lambert, L., Walker, D., Zimmerman, D., Cooper, J., Lambert, M. D., & Gardner, M.E., et.al. (1995). *The constructivist leader*. New York: Teachers College Press.
- In Sergiovanni, T. (2001). *The principalship: A reflective practice perspective*. Boston, MA: Allyn & Bacon.
- Rost, J. (1991). *Leadership for the twenty-first century*. New York: Praeger. In Sergiovanni, T. (2001). *The principalship: A reflective practice perspective*. Boston: Allyn & Bacon.
- Sergiovanni, T. (2001). *The principalship: A reflective practice perspective*. Boston: Allyn & Bacon.
- Thernstrom, A., & Thernstrom, S. (2003). *No excuses: Closing the racial gap in learning*. New York: Simon & Schuster.
- Tschannen-Moran, M., Uline, C., Woolfolk-Hoy, A., & Mackley, T. (2000). Creating smarter schools through collaboration. *Journal of Educational Administration*, 38(3), 247-271.
- Wolcott, H. F. (1994). *Transforming qualitative data: Description, analysis, and interpretation*. Thousand Oaks, CA: Sage.

Universal Design for Learning and Differentiated Instruction: Resolving Competing Mandates of the Individuals with Disabilities Education Act and No Child Left Behind

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Abstract: Recent federal mandates require accountability for providing students with disabilities access to the general education curriculum. In this paper, the authors recommend that principles of Universal Design for Learning and Differentiated Instruction can help school personnel tailor their teaching to meet the various strengths and needs of individual students.

Historically, teachers have been required to provide evidence of the successes of their teaching. Currently, they are plagued with accountability mandates. The No Child Left Behind Act (NCLB, 2002) mandates that 100% of students demonstrate adequate yearly progress, meaning that students should meet their state's academic achievement standards. If children with disabilities within a school fail to make adequate yearly progress toward reaching the proficiency goal in reading and math by 2014, the school potentially faces a host of remedial actions intended to improve school performance. In addition, schools must also comply with the Individuals with Disabilities Education Act (IDEA, 1997). IDEA requires that students with disabilities be educated with their peers without disabilities to the maximum extent appropriate. Students in special education can only be removed to separate classes or schools when the nature and the severity of their disabilities is such that they cannot receive an appropriate education in a general education classroom with supplementary aids and services. Enforcing both of these federal mandates has been an administrative challenge because most teachers are not trained or are not willing to meet the needs of these students.

Universal Design for Learning and Differentiated Instruction

Universal Design for Learning (UDL) was first developed by a working group of architects, product designers, engineers, and environmental design researchers. It makes products, communications, and the physical environment more usable by as many people as possible at little or no extra cost. Applied to public schools, UDL makes a district's curriculum, materials, and school environments more accessible and usable by all students from different backgrounds and with different learning styles (Meyer & Rose, 2002). UDL provides a set of principles for teachers and administrators to design curriculum that decreases segregation of students based on their different levels of performance. UDL increases access to the general education curriculum for students with disabilities (Gordon, 2002). Differentiated Instruction (DI) is a process wherein educators vary the learning activities, content demands, and modes of assessment to meet the needs and support the growth of each child (Tomlinson, 1999). DI provides different learning experiences in response to each student's needs.

The Research Process to Develop the Position Paper

During the Fall 2003 semester, each participant in EEX 7933 (Advanced Topics in Special Education Research) identified vexing issues that face special educators in the 21st century. The overlap with issues identified by Boehner (2002), chair of the House Committee on Reauthorization of IDEA, included balancing the competing demands of IDEA and NCLB. In what ways can teachers and administrators differentiate instruction, provide advocacy and

supports for families of children with disabilities in the face of high stakes testing, and ensure students with disabilities have meaningful access to the general education curriculum?

The authors brought their perspectives to the process. For example, Nevin, a professor with more than 30 years of experience in general and special education teacher preparation programs, brings a rich experience and action research base for providing differentiated instruction in general education classrooms. Falkenberg, a special educator, shares a co-teaching assignment with general educators in addition to her responsibilities as a resource room specialist. Nullman, a clinical speech pathologist, provides many services within pre-K through elementary school environments. Salazar, an assistant principal at a magnet school, is implementing a co-teaching grant that has resulted in a nearly 40% increase in the number of children with disabilities being instructed with their age-grade classmates. Silió, a program specialist, supports co-teaching teams who provide access to the general education curriculum for students with multiple disabilities.

The authors began their study of the issue by comparing and contrasting the views of a general education professor (Tomlinson, 1999) and a special education professor (Udvari-Solner, 2002). The authors also searched the Educational Resources Information Center (ERIC) database to find examples of current research and practice. Finally, the authors conducted interviews to discover perspectives from five participants: (a) a curriculum and instruction professor, (b) a special education doctoral student serving as an instructor, (c) a representative of Florida's Diagnostic and Learning Environment Resource System, (d) co-teachers in the public schools, and (e) an undergraduate of a program where special education concepts such as UDL and DI are infused in teacher preparation. Each participant generated a personal position statement. A constant comparative method (Bogdan & Biklan, 1998) helped the authors identify and select themes that formed the basis for the synthesis.

Obstacles for Universal Design and Differentiated Instruction

Two obstacles that have been identified in the literature include lack of space and lack of training, explained below.

Lack of Space

In many urban schools, the issue of overcrowding takes precedence over all else. Teaching forty or more students in one regular sized classroom may not be conducive to enthusiastic responses to UDL and DI from educators who have implemented the procedures. Some schools have two teachers sharing one space, which again poses the possibility of unenthusiastic reactions from teachers. Other issues include insufficiently funded schools wherein budget constraints and staffing challenges often force tough decisions regarding class size and scheduling.

Lack of Training

Training educators on the methods of universal design and differentiated instruction strategies and techniques may be quite inadequate in part due to lack of finances to hire substitutes so that teachers may attend training events. Both UDL and DI require collaborative planning amongst teachers with different curriculum knowledge and skills. Complaints that are often raised include lack of time to co-plan and lack of resources to teach a differentiated curriculum.

Support for Universal Design for Learning and Differentiated Instruction

In spite of the obstacles described above, there appears to be some support for selecting UDL and DI as a way of addressing the competing mandates. In this section, examples of UDL

and DI in the classroom are described. Attributes and dispositions of preservice and in-service teachers who use UDL and DI are articulated.

Classroom Applications of Universal Design for Learning and Differentiated Instruction

When teachers in differentiated classrooms use UDL and DI, they set individualized learning goals, define curricular content, structure learning activities, and conduct varied assessments that allow students to choose how to achieve the goals. Examples of UDL and DI in elementary and secondary schools are provided by Tomlinson (1999, 2002), Hall (2002), and Udvari-Solner (2002). An example at the local level is provided by an inclusion teacher at an elementary school in Miami-Dade County who uses both UDL and DI for his 5th grade class (Personal Communication, October, 2003). He recently planned a fifth-grade social studies lesson on holidays around the world where the students selected options for how to present the information they learned. Some students gave speeches, some made books, and others wrote plays or created PowerPoint slides. One student produced a videotaped interview of her Vietnamese grandparents detailing the rituals of a holiday called the Firecracker Festival. As part of the UDL planning process, the teacher routinely implements strategies to monitor progress of his students' skills and knowledge. Assessment strategies include accepting oral responses to math questions, typed responses for comprehension questions in language arts, portfolio assessments, and standardized test scores. When students demonstrate their understanding of specific concepts, he encourages them to move on. He noted, to his delight, that students, when given options, usually choose an appropriate level of difficulty for their next assignment.

Not only can classroom assessment strategies be adapted using UDL, Johnstone (2003) examined the effects of using UDL to adapt a standardized assessment test. The mixed methods analysis of 231 sixth grade students from traditionally under-performing schools involved comparing their scores on a traditionally designed large-scale assessment test to scores on a comparable test developed on the basis of UDL principles. Students scored significantly higher ($p \leq .05$) on the UDL designed test. Implications of the assessment study extend to other fields. For example, Meyers and Andresen (2000) recommend universal design principles in the design of medical and rehabilitative research, enabling better representation of people with disabilities.

Dispositions and Attributes of Teachers Using Universal Design and Differentiated Instruction

If administrators and teachers are to adopt the concept of universal design in their schools and classrooms, Assistant Principal Salazar agrees with Udvari-Solner (2002) that five research based dispositions must be internalized and accepted so as to bring about meaningful change in a school's methodology and culture: (a) Each student has unique characteristics which will require the teacher to recognize that teaching is not as easy as it is perceived; (b) Differentiating instruction with regards to the curriculum should be second nature and not a time consuming chore; (c) The UDL process allows the teacher to be proactive as they create content, process, and product in response to student readiness, interests and learning profiles; (d) Two heads will work better than one. Sharing lessons and materials, planning and solving problems, and co-teaching lessons together will create a synergy among the general educators, special educators, and related service personnel such as speech therapists; and (e) Effective teaching should be experienced by all students, not only students with special needs.

Students with disabilities, students at risk for school failure, students who are learning English as their second language, and students from culturally and ethnically diverse backgrounds benefit when their teachers share certain these attributes. As described by Udvari-Solner (2002), teachers who use UDL and DI tend to show these attributes: (a) they are proactive, (b) they use qualitative as well as quantitative assessment methods, (c) they use multiple

approaches to content, process, and products, (d) they are student-centered, and (e) they blend whole class, small group, and 1:1 instructional activities. Although the authors agree that a study of these dispositions and attributes would make an excellent research project, a good hypothesis might be that school reform is more likely to occur if these dispositions were shared by a school community.

Preparing Teachers to Use Universal Design for Learning and Differentiated Instruction

Can teachers acquire the dispositions, conceptual framework, and technical skills to effectively teach a diversity of children in 21st century schools? Historically, teacher preparation programs were separated into regular and special education programs and thus have not provided pre-service teachers with the intensive training and experience they need to be effective collaborators in planning, teaching, and evaluating instruction. An examination of existing curricula and the emerging demands on educators (e.g., use of technology, collaborative teaming and problem solving, linguistic diversity, inclusion of children with disabilities in general education) should lead faculty to understand the urgency to conceptualize new competencies, standards, content and experiences. Once competencies have been determined, a core set of courses or learning units and field experiences can be developed and required of all education majors.

Villa, Thousand and Chapple (2000) delineated how four universities “retooled their professional preparation programs to better ready graduates for meeting the challenges of inclusive 21st century education” (p. 536). At four universities (Trinity College, University of Vermont; Syracuse (NY) University, California State University San Marcos, and the University of Northern Colorado), faculty created “new and innovative training initiatives that model faculty and community collaboration and depart from traditional ways of inducting educators into their profession” (Villa et al., 2002, p. 536). An interviewee, a recent Syracuse University graduate revealed insight into the curriculum and innovative training that pre-service teachers can receive. The faculty had merged the previously separate elementary and special education programs to create a single inclusive elementary and special education teacher preparation program. Varied practicum experiences in inclusive inner-city, urban and suburban schools allow the opportunity to develop and apply skills to educate culturally diverse students as well as students with special needs. Graduates are certified in both elementary and special education. Although initially apprehensive, she reported that her “most valuable experiences were working one on one with children with special needs, and reading case studies on successful differentiated instruction programs” (Personal Communication, October, 2003). She feels capable to meet the challenges that inclusive educational settings might offer.

Although innovative programs are surfacing, many educators feel that they are ill prepared to respond effectively to the needs of a widely diverse population. Personnel in local communities, school districts and state departments of education currently are working diligently to prepare teachers to educate all children in general education environments through in-service programs. Survey research results emphasized the importance of avoiding single-session training experiences (Villa et al., 2002). Instead, in-service training formats should include options such as summer institutes, graduate courses, workshops, required in-service presentations, staff meetings, one-to-one consultation, conversation, mentoring, team teaching, video taping, and coaching. Some of the topics teachers most appreciate include new methods for adapting curriculum, teaching collaboratively, and introducing more than one curriculum at a time.

At the local level, representatives from Florida International University's (FIU) College of Education indicated in interviews that they are familiar with principles of UDL and DI, and that the principles and practices should be infused in more of the coursework offered throughout the teacher preparation programs at FIU. For example, a recent graduate of the special education doctoral program commented, "Adapting the lessons could get tricky if the teacher has a large class that is composed of children with a variety of disabilities" (Personal Communication, October 6, 2003).

Conclusions

Caveats that the authors offer in interpreting this position paper include the fact that the personal interviews may represent an unconscious selection bias, which suggests the need for validating the interviewees' responses with a larger sample. Moreover, the literature review needs to be expanded to provide historical and theoretical perspectives.

The authors hope that readers will be encouraged to conduct their own research on this issue to come to an informed agreement that Universal Design for Learning and Differentiated Instruction can empower educators and administrators to actualize the ideals of both the No Child Left Behind Act and the Individuals with Disabilities Education Act. The authors emphasize that there is an essential obligation to prepare today's educators to meet the challenge of teaching children with special needs and children from diverse backgrounds within an inclusion classroom. With administrative support from school districts and faculty in teacher preparation in colleges and universities, pre-service and in-service training can be provided so that educators will gain the critical knowledge and skills to implement the principles of UDL and DI. University faculty can restructure professional teacher education preparation programs so that graduates are no longer viewed as emerging from separate systems of education. Quality teachers possess a deep understanding of their content area knowledge and apply research-proven instructional strategies to appropriately educate their students.

There are no shortcuts to the intellectually demanding and challenging work of teaching. It is true that implementing the principles of UDL and DI for each student represents a lofty goal. America's students deserve no less. We agree with researchers such as L. Rose, a professor in the Technology in Education Program at Harvard Graduate School of Education: "UDL expands the number of opportunities kids have to succeed" (as cited in Gordon, 2002, p. 2).

References

- Boehner, J. (2002). *Great IDEAs about Special Education Reform*. U.S. House of Representatives Committee on Education and the Workforce. Retrieved December 2, 2003: <http://edworkforce.house.gov/issues/107th/education/idea/ideacomments/>
- Bogdan, R., & Biklen, S. (1998). *Qualitative research for education: An introduction to theory and methods*. Boston, MA: Allyn & Bacon.
- Gordon, D. (2002, Jan/Feb). Curriculum access in the digital age. *Harvard Education Letter: Research Online*. Retrieved February 14, 2004, <http://edletter.org/past/issues/2002-jf/digitalage.shtml>
- Hall, T. (2002). Differentiated instruction. Center for Applied Special Technology: National Center on Accessing the General Curriculum: *Effective classroom practices report*. Retrieved 2/14/04, <http://www.cast.org/nacac/index.cfm?i=2876>
- Individuals with Disabilities Education Act (IDEA) of 1990, 20 United States Congress 1412[a] [5], Reauthorized 1997.

- Johnstone, C. (2003). *Improving validity of large-scale tests: Universal design and student performance* (Technical Report 37). Minneapolis, MN: University of Minnesota, National Center on Educational Outcomes. Retrieved 2/14/04, from the World Wide Web: <http://education.umn.edu/nceo/OnlinePubs/Technical37.htm>
- No Child Left Behind. (NCLB). (2002). HB1. Retrieved 2/14/04, <http://www.ed.gov/policy/elsec/leg/esea02/beginning.html#sec1>.
- Meyer, A., & Rose, D. (2002). Universal design for individual differences. *Educational Leadership*, 58(3), 39-43.
- Meyers, A., & Andresen, E. (2000). Enabling our instruments: Accommodation, universal design, and access to participation in research. *Archives of Physical Medical Rehabilitation*, 81(Supplement 2), S5-S9.
- Tomlinson, C. A. (1999). *The differentiated classroom: Responding to the needs of all learners*. Alexandria, VA: Association for Supervision and Curriculum Development.
- Tomlinson, C.A. (2002). Differentiating instruction module. Retrieved 2/14/04 from <http://www.ascd.org/pdi/demo/diffinstr/differentiated1.html>
- Udvari-Solner, A. (2002). Access to the general education curriculum for all. In J. S. Thousand, R. A. Villa, & Nevin, A. (Eds.), *Creativity and collaborative learning: The practical guide to empowering students, teachers and families* (2nd ed., pp. 85-101). Baltimore: Paul H. Brookes.
- Villa, R. A., Thousand, J. S., & Chapple, J. W. (2000). Preparing educators to implement inclusive practices. In R. A. Villa & J. S. Thousand (Eds.), *Restructuring for caring and effective education: Piecing the puzzle together* (2nd ed., pp. 531-557). Baltimore: Paul H. Brookes.

Performance on WAIS-III relates to the Ability to Derive Relations

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Abstract: Experimental evidence suggests that derived relational responding (DRR) may provide a behavioral model of complex language phenomena. This study assigned 72 students to groups based upon their performance on a complex relational task. It was found that performance on DRR relates to scores on the WAIS-III.

One reason for the interest in derived relational responding, and stimulus equivalence in particular, is that a model of symbolic relations can be provided. The symbolic relations refer to relational frames among stimuli in the world which are represented in the form of symbols like words or numbers. The bi-directional relationship between a word and its meaning may be a *derived*, or untrained relation. For example, when trained that A is the ‘same as’ B, a subject typically chooses B as the ‘same as’ A. When trained $A = B$, $B = C$, a subject typically derived a relation $A = C$. Hayes and Bisset (1998) discovered that subjects responded with more accuracy and speed to nonsense words that were semantically related than to those which were unrelated.

With pre-linguistic children, performance on derived relational responding tasks varies with language performance (Pelaez, Gewirtz, Sanchez, & Mahabir, 2000). Pelaez, et al. (2000) found that infants can derive relations like stimulus equivalence even before they acquire language. Also, Barnes, McCullagh, and Keenan (1990) compared equivalence class formation in non-hearing impaired children and hearing impaired children. Complex derived relational performances emerge readily in language-able subjects.

Derived relational responding and the WAIS-III

The Wechsler Adult Intelligence Scale – Third Edition (WAIS-III; Wechsler, 1997) was used in this study to relate the subjects’ verbal performances in this test to their ability to derive relations. We were interested in the verbal performance on the WAIS-III, specifically the vocabulary and arithmetic performances. This study looked only at the subjects’ performance on the sub-tests indicating verbal IQ factors (verbal comprehension and arithmetic) because these particular sub-tests contribute to the growing literature on derived stimulus relations and provide the first step to increasing the relevance of behavioral approaches to language within mainstream psychology.

Thus, the vocabulary, arithmetic, and digit symbol coding sub-tests were assessed and compared in this study. The vocabulary sub-test contributes to the verbal comprehension index and verbal IQ factors; the arithmetic sub-test contributes to the working memory index and verbal IQ factors; while the digit symbol coding sub-test contributes to the processing speed index and performance IQ factors.

Derived Relational Responding

Human subjects can be trained to respond to a variety of derived relations. Barnes-Holmes et al (2001) Relational Frame Theory (RFT) emphasizes that:

Persons with a highly elaborated vocabulary will tend to have highly elaborated

relational repertoires. Nevertheless, it is the relational skills that are key, not merely not merely verbal content in a formal sense. A task, such as learning to spell is far less relationally rich than learning word meaning, and thus it is no surprise that spelling performance will correlate less with overall levels of intellectual behavior even though both tasks involve verbal material. (p. 160)

For this reason, it was predicted that higher levels of proficiency on derived relational responding (DRR) tests should be a better predictor of performance on a vocabulary sub-test on the WAIS-III than on other, less relationally-rich sub-tests. This study was an experimental demonstration of this prediction.

Method

Subjects

Twenty-six monolingual and forty-six bilingual college students, ranging from 18 to 54 years of age, received partial course credit in Psychology for their participation in this study. All students were enrolled in Florida International University, and none had previous knowledge of either the study of derived relational responding or the WAIS-III scale.

Design

The laboratory consisted of three small rooms. The subject arrived at his/her designated appointment time, was welcomed into the waiting room, and given the informed consent form to read, sign, and date. The student then completed a brief demographic questionnaire concerning age, ethnicity, country of birth, length of time in Miami, major, and grade point average. Included on this form were questions of whether the subject was monolingual or bilingual, their primary and secondary languages, and a self-assessment of fluency in the second language. At this point, the lab assistant administered and audio recorded an assessment of Spanish comprehension.

The subject was then escorted into an adjacent control-observational room where he/she completed the relational responding task on one of the Apple iMac computers. Only the Z and M keys were used by the subject during the experiment. PsyScope software was used for its ability to control presentation of stimuli and record responses (Cohen, MacWhinney, Flatt, & Provost, 1993). The amount of time required for this section of the experiment varied by subject, but averaged ninety minutes. Upon completion, the subject made an appointment with the lab assistant to return for the third section of the experiment, the Wechsler Adult Intelligence Scale-III (Wechsler, 1997). The results of three sub-tests were used to assess each subject.

Procedure

Subjects participating in this study were exposed to three separate tasks: (1) an assessment of language comprehension; (2) a complex relational task administered on a computer; (3) the WAIS-III vocabulary, arithmetic, and digit-symbol coding sub-tests. After completion, the subjects were debriefed and left the laboratory. Following is a brief description of the three tasks.

Monolingual-Bilingual Assessment

The Spanish Language Comprehension Assessment was used in order to test second language ability. From a bank of ten questions, one was read aloud in Spanish by the experimenter and answered aloud by the subject, who then both read and answered aloud the second question. The third question was read silently by the subject and his/her answer was written. (All responses were in Spanish.) Both expressive and receptive language skills were scored by two fully bilingual psychology graduate students. The subjects were assigned to one of

four groups based upon their scores: fully monolingual, monolingual, bilingual, or fully bilingual.

Relational Task

The relational task used (O'Hora et al, in press) trained subjects to respond according to specific relations (e.g., *before* and *after*, and *same* and *different*). An additional phase tested the generalization of the derived relational responding performance in the presence of novel stimulus sets. Subjects read minimal instructions presented on the computer and experimenters gave no verbal cues. Subjects who completed the relational task were assigned to the Relational Consistent Responding (RCR) group, while those failing any part of the task were assigned to the Relational Inconsistent (RIR) group.

Wechsler Adult Intelligence Scale-Third Edition (WAIS-III)

The WAIS-III is a clinical instrument used to measure the intellectual ability of adults (16-89 years of age). It contains fourteen sub-tests, however, only the vocabulary, arithmetic, and digit-symbol coding were considered in this study. The vocabulary test consisted of the subject defining 33 words which were orally and visually presented by the trained examiner. If the response was vague or not clear, the examiner asked him/her to "tell me more about it" or "tell me what you mean". No other instructions were given. The examiner recorded the subject's answer verbatim. The second sub-test consisted of a series of 20 arithmetic problems presented orally by the examiner. The subject's task was to solve each problem mentally and respond within a certain time limit. The subject's answer and time were recorded. The digit-symbol coding test allowed the subject 120 seconds to draw the hieroglyphic-like symbols for as many numbers as possible. The digits one through nine and their related symbols were shown at the top of the paper used by the subject. Complete descriptions of the tests, administration directions, and scoring procedures may be seen in the WAIS-III Administration and Scoring Manual (Wechsler, 1991, 1997).

Results

Descriptive Analysis of the Data

The high number of subjects employed in the current study precludes the presentation of individual data. Rather, salient characteristics of subjects' performances on Monolingual/Bilingual Assessment, the Relational Task, and the WAIS-III sub-tests are discussed.

Monolingual/Bilingual assessment. The number of subjects assigned to each monolingual/bilingual category was as follows: 15 Fully Monolingual (a score of 5-7); 11 Monolingual (a score of 8-10); 8 Bilingual (a score of 11-15); 41 Fully Bilingual (a score of 16-25). Subjects in both the Fully Monolingual and Monolingual categories were treated as Monolingual ($N=26$) and subjects in both the Fully Bilingual and Bilingual categories were treated as Bilingual ($N=49$) for statistical analyses.

Computer-Based Model of Instructional Control. Thirty-two subjects failed to achieve the mastery criterion on Relational Training for *before* and *after*. The remaining 43 subjects achieved the mastery criterion on this phase and also satisfied the mastery criterion on this relational responding test, as well as the training and test for *same* and *different*. Of these 43 subjects, 31 passed the Tests for Instructional Control and Generalization with 24 novel stimulus sets. In total, therefore, 31 subjects successfully completed the derived relational test (relational-consistent responding; RCR) and 44 failed (relational-inconsistent responding; RIR).

The Wechsler Adult Intelligence Scale-Third Edition (WAIS-III). Mean scores of each of the four experimental groups were calculated on each of the three WAIS-III sub-tests. On the

vocabulary sub-test, the highest mean score was obtained from the Monolingual RCR group ($M = 13.1, SD = 1.85$) and the lowest from the Monolingual RIR group ($M = 10.6, SD = 1.78$). On the arithmetic sub-test, the highest mean score was obtained from the Monolingual RCR group ($M = 12.0, SD = 1.94$), and the lowest from the Monolingual RIR group ($M = 10.2, SD = 2.04$). On the digit-symbol encoding sub-test, the highest mean score was obtained from the Monolingual RCR group ($M = 12.4, SD = 2.8$), and the lowest from the Bilingual RIR group ($M = 11.1, SD = 2.62$).

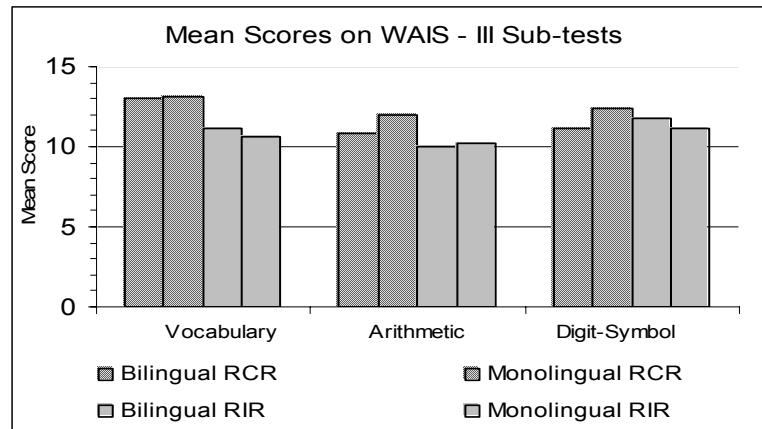


Figure 1. The bars represent the mean scores on each of the three WAIS-III sub-tests (vocabulary, arithmetic and digital coding) for each of the four groups of subjects. The bilingual relational consistent responding (RCR), the bilingual relational inconsistent responding (RIR), the monolingual relational consistent responding (RCR), and the monolingual relational inconsistent responding (RIR).

Statistical Analyses

The first analysis conducted was a Multivariate Analysis of Variance (MANOVA). A 2 (RCR vs. RIR) X 2 (bilingual vs. monolingual) analysis on three dependent measures (i.e., the three WAIS-III subtests: vocabulary, arithmetic, and digit-symbol coding) was conducted. This MANOVA yielded a significant main effect for the RCR ($N=31$) vs. RIR ($N=44$) groups ($F(3,69) = 7.31, p = .0002$) using Wilk's Lambda (.759), Roy's Greatest Root (.318), Hotelling-Lawley Trace (.318), and Pillai Trace (.241). No significant effect due to bilingual vs. monolingual was found, and no interaction effect between the two factors was obtained. Given no difference between monolingual and bilingual subjects, the data of the monolingual and bilingual groups were collapsed ($N = 75$) for subsequent independent ANOVAs on the three main dependent measures. The first ANOVA yielded a significant difference between the performances of the RCR group ($N = 31; M = 13.05, SD = 1.81$) and the RIR group ($N = 44; M = 10.9, SD = 1.87$) on the vocabulary sub-test of the WAIS-III ($F(1, 71) = 21.78, p < .0001$). In addition, a significant effect for the arithmetic sub-test ($F(1, 71) = 5.90, p = .017$) was found between RCR ($N = 31; M = 11.42, SD = 2.02$) and the RIR group ($N = 44; M = 10.09, SD = 2.25$). No significant effects ($p > .05$) were obtained between the RCR group ($N = 31; M = 11.5, SD = 2.71$) and the RIR group ($N = 44; M = 11.6, SD = 3.14$) on the digit-symbol encoding sub-test.

An additional analysis was conducted to measure the relationship between the performance on the first relational training phase and the performance on the vocabulary and arithmetic sub-tests. To conduct this analysis, the percentage of correct responses produced by

each subject on the relational training phase was calculated. Two separate Pearson r correlations revealed significant correlations between scores on the vocabulary sub-test and the number of correct responses during Relational Training for *before* and *after* ($r = .342, p = .002, N = 74$) and between scores on the arithmetic sub-test and the number of correct responses on this relational training phase ($r = .231, p = .003, N = 74$).

Conclusion

In our current study, performance on a complex relational task predicted performance on verbal sub-tests of the Wechsler Adult Intelligence Scale-Third Edition (WAIS-III). This finding contributes to the growing body of research that suggests that derived relational responding (DRR) and language are closely related phenomena. From a developmental perspective, the development of DRR provides an alternative to 'bootstrapping' accounts of children's progress from non-language to language development (see Altmann, 2001 for a detailed discussion). From an evolutionary perspective, Dickens and Dickens (2001) have suggested that DRR may be critical to understanding how humans as a species have made the same transition. Such a behavioral account may go along well with recent biological research on the plasticity of brain function and the importance of context on these types of performances (e.g., Robertson & Murre, 1999).

Further studies might well consider employing the full WAIS-III instrument in order to analyze relationships between derived relational performances and both verbal comprehension and verbal IQ factors, and also use each of the full compliments of sub-tests (cf. Taub, 2001). Such future work might allow for isolation of specific properties of language performance as traditionally defined that is particularly similar to specific derived relational performances.

References

- Altmann, G. T. M. (2001). The language machine: Psycholinguistics in review. *British Journal of Psychology*, 92, 129-170.
- Barnes, D., McCullagh, P. D., & Keenan, M. (1990). Equivalence class formation in non-hearing impaired children and hearing impaired children. *The Analysis of Verbal Behavior*, 8, 1-11.
- Barnes-Holmes, Y., Barnes-Holmes, D., Roche, B., Healy, O., Lyddy, F., Cullinan, V., & Hayes, S.C. (2001). Psychological development. In S. C. Hayes, D. Barnes-Holmes, & B.T. Roche (Eds.), *Relational Frame Theory: A post-Skinnerian account of human language and cognition* (pp.157-180). New York: Academic Press.
- Cohen, J. D., MacWhinney, B., Flatt, M., & Provost, J. (1993). PsyScope: A new graphic interactive environment for designing psychology experiments. *Behavioral Research Methods, Instruments and Computers*, 25(2), 257-271.
- Dickens, T. E., & Dickens, D. W. (2001). Symbols, stimulus equivalence and the origins of language. *Behavior and Philosophy*, 29, 221-244.
- Hayes, S. C., & Bisset, R. T. (1998). Derived stimulus relations produce mediated and episodic priming. *The Psychological Record*, 48, 617-630.
- O'Hora, D., Barnes-Holmes, D., Roche, B., & Smeets, P. (in press). Derived relational networks as novel instructions: a possible model of generative verbal control. *The Psychological Record*.
- Pelaez, M., Gewirtz, J. L., Sanchez, A., & Mahabir, N. M. (2000). Exploring stimulus equivalence formation in infants. *Behavior Development Bulletin*, 9, 20-25.

- Robertson, I. H., & Murre, J. M. J. (1999). Rehabilitation of brain damage: brain plasticity and principles of guided recovery. *Psychological Bulletin*, 125, 544-575.
- Taub, G. E. (2001). A confirmatory analysis of the Wechsler Adult Intelligence Scale-Third Edition: is the verbal/performance discrepancy justified? *Practical Assessment, Research, & Evaluation*, 7(22).
- Wechsler, D. (1991). *Wechsler Intelligence Scale for Children-Third Edition*. San Antonio, TX: The Psychological Corp.
- Wechsler, D. (1997). *Wechsler Adult Intelligence Scale-Third Edition*. San Antonio: The Psychological Corp.

Technology Integration and School Leadership

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Abstract: The No Child Left Behind Act of 2001 (NCLB) brought many significant changes to American schools including accessibility to technology. Through an extensive literature review of the relationship between technology leadership and student achievement, five major themes emerged from data that support the need for more effective computer-based education in schools.

The NCLB Act stresses the importance of providing technology integration for all students, teachers and school leaders. In short, this translates into technology integration initiatives for educators across the nation. Consequently, educational leaders have been scrambling to get a handle on what it means for them, and how to deal with the mandates, deadlines, and requirements. Today's convergence of a down economy, unprecedented cutbacks, and new NCLB accountability requirements make it tougher than ever for educational leadership (McLester, 2003). Building an infrastructure enables integration of technology into curriculum and provides information to the public. Teachers and administrators agree that they can not meet the goals of the nation without effectively implementing technology in today's classrooms. This paper explores the effectiveness of integrating technology for improving student achievement. In addition, it also addresses the critical role school administrators play in effectively implementing and supporting the use of educational technology within their schools.

Method

A review of the literature was used to collect data for this manuscript. The data were extrapolated from on-line press releases, professional and academic journals, as well as pertinent web sites and teaching experience from past years. Once these data were collected, they were placed in categories for analysis. Each article was read, re-read and analyzed in order to create common themes and categories on the effects of educational technology in student achievement and the role that school administrators have in the successful implementation. The analysis was conducted by reading and re-reading the data, and cross-checking to keep track of common themes and patterns that emerged. The data within the articles were compared and categorized by subject matter taught in a school setting. For example, some of the research articles focus their data in subject matter such as mathematics and science, while others concluded studies in reading comprehension and analyzing text. The following conceptual organizers occurred as a direct result from the literature search: (a) changing ways of learning, (b) technology in the classroom, (c) student achievement, and (d) administrators' role, and (e) obstacles in the classroom.

Theoretical Perspective

The decline in student achievement and performance on standardized state exams such as the Florida Comprehensive Assessment Test (FCAT) and the Stanford Assessment Test (SAT) has been a concern in state governments for many years (Berliner & Biddle, 1995). Increasing student achievement has long been a debate of government officials, school administrators, teachers, parents, and students. In an effort to raise student standards and improve the public educational system, President George W. Bush created the No Child Left Behind Act of 2001, also known as NCLB. No Child Left behind Act of 2001 is considered to be a landmark in

education reform designed to improve student achievement and change the culture of America's schools (NCLB, 2003). The NCLB is built on four common sense pillars: accountability for results, an emphasis on doing what works based on scientific research, expanded parental options, and expanded local control and flexibility.

Changing the Way They Learn

The effectiveness of educational technology has often been debatable among students, educators, administrators, and government officials. Liu, Macmillan, and Timmons (1998) found that 57% of students in the study agreed that computers were a waste of money while 52% of the students disagreed and stated that computers made their work easy (p.195). Students perceive the use of technology in the classroom differently from their teachers or administrators. Liu et al. (1998) state that when students were asked about technology impacting their academic subjects, many students said that the use of computers to complete assignments had made their learning more engaging and more interesting. In addition, the students were more enthusiastic about the learning process. (Liu et al., 1998, p. 195). In addition, the study found that students who use computers throughout their educational process at home or in the classroom will have a desire to use them in the future. A study conducted by The International Association for the Evaluation of Educational Achievement (IEA) found that in most countries the integration of computers into school subjects tended to be focused within the higher grade levels (Liu et al., 1998, p. 189).

Technology in the Classroom

Teachers have often felt the burden of having to implement the use of technology in their educational programs in addition to many other instructional mandates. Integrating technology in the classroom involves activities such as the use of multi-media mathematical activities, in which a computer program that gives students the opportunity to solve mathematical problems at their appropriate instructional level and provides feedback. Activities that involve the use of computers enable the students to develop basic math skills and also develop higher order thinking skills. Using technology provides the learning of skills through different learning modalities. For example, students can use their sense of sight and sound to complete activities such as algebraic problems. In contrast, textbooks would only provide students with a two dimensional picture of the information. Students that are auditory learners would experience difficulties learning through the visual modality alone. Furthermore, the use of computers is not limited for the development of mathematical skills. Computers and technology can also be used in different subject areas such as foreign languages, reading, language arts, and science. Students can write, listen to, and read stories on the computer. However, adequate training for administrators, teachers, parents who volunteer on the appropriate and effective use of computers and instructional programs has been seldom offered? Consequently, the computers have been left sitting on tables collecting dust without use. According to Goddard (2002), the call for technology has gone out for higher standards and challenging learning activities; some elementary teachers are still sitting in their classrooms, staring at their computers, lamenting how change is difficult. Since the passing of the 2001 NCLB Act, the use of technology as a tool for learning in the classroom is a requirement that teachers have to abide by. The technology component of the No Child Left Behind Act is part D of Title II, called Enhancing Education through Technology. The Enhancing Education through Technology calls for states to submit an application addressing 15 topics related on how they will use their technology money to the Education Department (Fletcher, 2003, p. 56). The NCLB deadline for states to ensure technology will be fully integrated into the curricula and instruction of their schools is December

31, 2006. The NCLB bill also calls for national technology activities, including a long-term study on technology in education and the creation of a national education technology plan (Fletcher, 2003, p. 56). Furthermore, studies on the effectiveness of educational technology have been ongoing for several years.

Student Achievement

Some professionals claimed that the use of technology would be the solution to the problems in education. Hope (1997) stated that technology was being viewed as indispensable in schools during the 1990's (p. 3). According to Lowe (2002), many educators believe that Computer Based Education (CBE) is the panacea for education because of the education theories used in the development of the computer. "The cognitive orientation comes from a belief that students need to develop an understanding of the underlying concepts associated with any task and that this understanding is developed by allowing the students to interact actively with the environment" (Lowe, 2002, p. 164). The use of technology has allowed students in educational programs to individualize the program at each student's ability level and interact actively by answering questions and receiving corrective feedback, therefore making them an effective instructional and tutorial tool. Lowe's (2002) results indicated that CBE positively affected student achievement when compared to traditional classroom instruction by increasing their involvement in class projects and decreasing the time it takes to complete assignments (p. 167). Although the benefit of using educational technology to increase student achievement is evident, Lowe (2002) states that CBE should be used to enhance conventional teaching methods, not replace them (p. 168).

Administrators' Role

School administrators play a critical role in the effective implementation of educational technology in their schools. "A school administrator is an educational leader who promotes the success of all students by advocating, nurturing, and sustaining a school culture and instructional programs conducive to student learning and staff professional growth" (Ditzhazy & Poolsup, 2002, p. 10). Changing teachers' mind frame on the effective and multiple uses of technology might be a difficult task to accomplish; however, administrators have the advantage of making their staff feeling comfortable with this new change by providing clear expectations, support, and time for the technology plan to take place. Neither forcing nor obligating the use of technology will be conducive to continued use in the future. Hope (1997) discovered that technology in schools had not reached the level that had been envisioned, or the impact expected by so many, finding instead that some teachers in the school setting continue to teach the way they were taught when they were in school (Galín, 1995), and technology remains conceptualized as an add-on luxury (IBM, 1995) rather than integral to achieving educational outcomes. Goddard (2002) states that change may be difficult, but educators who capitalize on the relationship between technology and education reform can help students develop higher-order thinking skills and function effectively in a world beyond the classroom (p. 25). Introducing technology in schools threatens to disrupt the existing structure of the schools (Hope, 1997, p. 3). Furthermore, technology engenders new relationships between teachers, alters priorities regarding the allocation of resources, disrupts the continuity of schedule construction, and influences the kind of experiences teachers design for students (Hope, 1997). For teachers, knowledge of available software that can be implemented into the curriculum and comfort level that are increased with time of use can eliminate old teaching methods that are ineffective or inefficient. Additionally, application should include clear expectations, training and placement, equipment and physical capacity, incentives, and methods of encouraging internal motivation (Goddard, 2002, p. 23).

Moreover, teachers need to be acknowledged for what they do. Just like students, teachers need praise and encouragement to give them the motivation to continue to explore and use technology.

According to Hope (1997), technology can reach its potential in schools only when school leaders, change agents, and teachers understand the impact these factors have on technology integration and use (p. 3). School administrators have the responsibility for understanding their staff's needs, teaching styles, curriculum goals, and students' needs in order to effectively create a plan that will be successfully adopted and implemented. School administrators also serve as role models in the use of technology. Faculty meetings could be conducted using PowerPoint presentations, in order to model an effective technology tool to deliver information. According to Hope (1997), leadership is viewed as being essential to the progress and performance of an organization. Therefore, lack of leadership is recognized as one of the obstacles to technology's integration into the instructional process of school (Galbraith, Grice, Carss, Edean, & Warry, 1990).

Obstacles in the Classroom

It has been found that students will use computers to the capacity that their teachers have taught them. This clearly might limit some students in their potential to explore other technological uses. Ditzhazy and Poolsup (2002) state that continuing current research suggests that student learning improvement relates to what teachers do in the classroom (p. 10). In addition, Ditzhazy and Poolsup (2002) state that teachers experience many obstacles to technology integration in their classrooms and that their skills and knowledge are critical to success. Professional development is a critical component of successful technology implementation in schools. School administrators have the responsibility of offering their school staff professional development opportunities. Furthermore, the administrator should evaluate each staff member's unique needs, in order to offer the most adequate professional development for him/ her. Hope (1997) suggests that for principals to support technology in a school, they are required to respond to teachers' demands for time and resources to use technology (p. 4). Ditzhazy and Poolsup (2002) found that teachers' skills and knowledge are critical factors in the successful integration of technology. Recent research shows that although teachers are eager to use technology for curricular activities, the lack of effective professional development programs and time dedicated to experimentation hinder successful integration (Ditzhazy & Poolsup, 2002, p. 11). Adequate professional development will increase the appropriate use of technology within the classrooms. In addition to the initial development, continuous professional developments need to be offered throughout the school year for the implementation of specific programs and to meet the continuous development needs of the staff. It is imperative to have appropriate training (Ditzhazy & Poolsup, 2002, p. 12).

Corporations are going to benefit hiring employees who are computer literate and know how to perform different tasks such as using technology to analyze data, make presentations, search for information, and create documents on the computer. In our society today, the number of computers being used in the home has increased because of the low cost that companies offer, services and support, an increasing number of technological advances available to schools, and huge investments by corporations to wire America (Goddard, 2002, p. 25). According to a report published by the U.S. Department of Education in October 2003, "Internet access in U.S. public schools and classrooms: 1994-2002," 99 percent of public schools in the United States had access to the Internet.

Conclusions and Implications for Practitioners and Policymakers

Educators must look continually at the answers to old questions, include new information as it becomes available, and make new, more informed decisions. Once these decisions are made, problem solving occurs. The process of identifying relationships, determining causation, and implementing remedies begins again. District and school site administrators, teachers, students, parents and the business community must continue to work together to create and support conditions such that no child, no teacher, nor administrator is neglected.

Although technology may not be for everyone, with the proper support, training, and funding, teachers and administrators can find that technology is not another task or curriculum that needs to be implemented into an already exhausted system. Implementation can be successful with time, support from other staff members, and proper training. Teachers and administrators can develop intrinsic and extrinsic motivation to use technology in their planning across the curriculum. Finally, continued support and monitoring would need to be conducted through the process. Change is difficult, but the benefits of technology integration into school curriculum and leadership are far greater. Through collaboration and dedication, success can be reached.

References

- Christmann, E., Badgett, J., & Lucking, R. (1997). Progressive comparison of the effects of computer-assisted instruction on the academic achievement of secondary students. *Journal of Research on Computing in Education*, 29, 325-337.
- Berliner, D. C., & Biddle, B. J. (1995). *The manufactured crisis: Myths, fraud, and the attack on America's public schools*. Redding, MA: Addison-Wesley.
- Ditzhazy, H. E. R., & Poolsup, S. (2002). Successful integration of technology into the classroom. *The Delta Kappa Gamma Bulletin*, 68(3), 10-14.
- Fletcher, G. (2003). Making sense of NCLB's technology component. *T.H.E. Journal*, 30(7), 56.
- Goddard, M. (2002). What do we do with these computers? Reflections on technology in the classroom. *Journal of Research on Technology in Education*, 35(1), 19-26.
- Gormly, E. K. (1996). Implementation of technology in American public schools: A qualitative study. *American Secondary Education*, 24(2), 14-25.
- Hope, W. C. (1997). Why technology has not realized its potential in schools: A perspective. *American Secondary Education*, 25, 2-9.
- Liu, X., Macmillian, R. B., & Timmons, V. (1998). Assessing the impact of computer integration on students. *Journal of Research on Computing in Education*, 31(2), 189-203.
- Lowe, J. (2002). Computer-based education: Is it a panacea? *Journal of Research on Technology in Education*, 34(2), 163-171.
- McLester, S. (2003). No Child Left Behind, *Technology and Learning*, 23 (11), 4.
- No Child Left Behind. (n.d.). Retrieved October 27, 2003, from <http://www.ed.gov/print/nclb/overview/intro/index.html>
- Solomon, G. (2003). 12 Tips on doing more with less. *Technology and Learning*, 23(11), 49-59.
- U.S. Department of Education. (2003). *Internet access in U.S. public schools and classrooms: 1994-2002*. Retrieved on October 27, 2003, from <http://nces.ed.gov/pubsearch/pubsinfo.asp?pubid=2004011>

U.S. Department of Education, National Center for Education Statistics. (2002).
Technology in schools: Suggestions, tools, and guidelines for assessing technology in elementary and secondary education, Prepared by the Technology in Schools Task Force, Washington, DC, National Forum on Education Statistics (NCES 2003, p. 313).

Human Resource Development Practices in U.S. Enterprises in Russia: A Literature Review

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Abstract: This study investigated human resource development (HRD) in Russian enterprises, U.S. firms in Russia, or U.S.-Russian joint ventures. Thirty-three articles were selected through a database search and examined using content analysis. Emerging themes included workers' knowledge and skills, training practices, organizational involvement, responsibility, and communication, and leadership styles.

Since the collapse of the Soviet empire, Russia has been attracting foreign investors and businesses. The number of U.S. businesses operating in Russia increased from a couple of dozen in 1991 to several hundred in 1996 (Thach, 1996). In 2001, the U.S. was the biggest foreign investor in Russia with 5 billion dollars in direct investments and 10 billion dollars in two-way trade of goods and services (Evans, 2001). The interest has extended from Russia's rich natural resources to its hardly competitive market and cheap but skilled labor (Fey, 1995). Success of foreign firms and joint ventures in Russia depends on the people working for them, but the areas of human resource development and human resource management represent challenges. The concept of human resources called "kadri" or cadre differed during the Soviet era. The system of K-12 and post-secondary education was well-developed and considered sufficient to prepare a qualified workforce. Therefore, on-the-job development was given little attention (Fey, Engstrom, & Bjorkman, 1999; Thach, 1996).

Since the average Russian employee knew a little about market economy, Western consulting firms and partnerships on academic and practitioner levels were established to provide help to various aspects of business. Fey et al. (1999) found over 20 foreign firms in Moscow offer training seminars and consultations, some Russian firms send their top managers abroad, and many develop in-house training courses. However, the effectiveness of Western-based programs for employee development has been questioned since they often offer "quick-fix packages and 'canned' prescriptions" and lack three crucial components: "(a) pre-training preparation ..., (b) knowledgeable trainers ..., and (c) an in-depth understanding of the intricacies unique to the Russian business culture" (May, Young, & Ledgerwood, 1998, p. 450). Employees' job performance and behavior are influenced by Russian cultural values, beliefs, and attitudes (Vlachoutsicos, 2001). Therefore, understanding of Russian cultural values and ways they affect how education is perceived and delivered can contribute to the effectiveness of HRD practices (Shaw & Ormston, 2001). The purpose of this paper is to examine the literature on HRD in Russian enterprises, U.S. firms in Russia, or U.S.-Russian joint ventures to determine the role and function of HRD practitioners and researchers in creating a successful economic transition. The paper sought to answer one research question: What major topics related to HRD in Russian enterprises, U.S. firms in Russia, or U.S.-Russian joint ventures have been discussed in the literature?

Method

Written materials provide a valuable source of data for qualitative research (Patton, 2002), so articles from scholarly and practitioners' journals relevant to the study were analyzed.

Since the study aimed at examining literature, content analysis was chosen as the research method. Content analysis is used to make sense of text and identify “core consistencies and meanings” which are called patterns or themes (Patton, 2002, p. 453). Patton explains that a pattern takes a form of a descriptive finding, yet a theme has “a more categorical or topical form” (p. 453). Since the research questions focused on topics, content analysis was used to identify themes emerging from the literature.

Databases and Descriptors

Educational Resources Information Center (ERIC) was searched as the largest education database. ABI Inform and Business File ASAP, were searched since they provide access to scholarly and practitioners’ publications in business. Human Resource Development Quarterly (HRDQ), the leading journal in the field, was searched. Since databases provide access to thousands of publications, combinations of descriptors were used; the descriptor Russia in combination with HR, human resources, HRD, human resource development, business, employees, training, and joint venture. The search of HRDQ used single descriptions: Russia, Soviet Union, USSR, communist, Russian, Europe, and Eastern Europe. They were not combined with the descriptor human resources due to the nature of the journal.

Search Process and Data Analysis

Each database search produced a list of records that were examined and limited based on the following selection criteria: (a) the articles must be written in English; (b) they must include U.S. researchers or teams of researchers with at least one U.S. author; (c) they had to be published in a U.S. journal or magazine, as anonymous authors were excluded; (d) they had to be written after 1990, as that would allow five years to elapse since the inception of political changes in Russia; and (e) they had to discuss relevant issues in HRD in Russian enterprises, U.S. firms in Russia, or U.S.-Russian joint ventures. ERIC produced 211 hits, and 37 were selected. ABI/Inform and Business File ASAP produced 1142 and 187 hits, and 63 and 29 articles were selected, respectively. HRDQ search resulted in 13 hits; 9 articles were selected. The total of 138 articles was further reduced to 33 due to duplication.

Inductive analysis, “immersion in details and specifics of the data to discover important patterns, themes, and interrelationships [...]; guided by analytical principles rather than rules” was used as the analysis strategy (Patton, 2002, p. 41). Each article was read once. Sections, paragraphs, or sentences in the article were highlighted if they were relevant to the study. In a separate journal, I summarized the content of the selected passages using bullets. Then, I cross-examined the summaries in the journal looking for the most recurrent topics across the individual article summaries. The articles pertaining to each topic were read again to ensure integrity.

Discussion

Data analysis is derived from two sources: research purpose and questions posted in the conceptual framework and “analytic insights and interpretations that emerged during data collection” (Patton, 2002, p. 437). Although this study did not aim at examining types of research utilized to explore the topic, “understanding how and why” the written materials were produced is one of the essential but challenging aspects of data analysis (Patton, 2002, p. 498).

Distribution of Articles

The first theme emerging during the data collection was that most articles seemed to be published in the mid-90s. Further analysis showed that out of 33 articles reviewed, 23 were published between 1992 and 1997; however, only 10 were produced in the six years that followed. No articles published in 1990 and 1991 met the search criteria. This disproportionate number of publications was surprising since Russia’s integration into the global economy has not

stopped. Possible reasons may include a preference to publish outside of the U.S. and a decline in researchers' interest, possibly due to political events in either country. Next, information presented in the articles came from a variety of sources. Out of 33 articles, only 15 were based on empirical research: nine were quantitative, four were qualitative, and two others used mixed methods. Three articles represented literature reviews, but twelve more are based on "anecdotal evidence" that comes from personal experiences of visiting, working or training in Russia (Ardichvili, Cardozo, & Gaspirashvili, 1998, p. 146). The remaining 3 simply reported on status of a training initiative.

Topic Themes

Three broad topics emerged from the literature: training, organizational culture, and managers. Twenty-two articles discussed Russian workers' knowledge and skills and training practices. Eighteen focused on workers' organizational involvement, responsibility, and communication, and five targeted leadership/management styles.

Knowledge and skills. One of the first challenges in operating in Russia was Russian managers' lack of skills and knowledge in the areas of general managerial, business, leadership, and functional/technical, which are considered vital in U.S. business, due to little managerial education during the Soviet era (Cooley, 1997; Messmer, 1994). Russian managers have more "engineering, problem-solving mind-set" with emphasis on quantitative skills, rather than "the human behavior focus of many Western managers," thus lacking knowledge and experience in strategic planning, leadership, and empowerment (Proffitt, Hill, Armstrong, & Engel, 1997, p. 60). Employees in non-managerial positions also need to expand their knowledge and skills in functional areas (Cooley, 1997), basic office procedures, business psychology, delegation, decision making, customer service, and practices of communication between male and female employees accepted in Western enterprises (Stagner, 1996).

Russian employees possess qualities that can contribute to the success of the company. Lawrence and Vlachoutsicos (1993) argue that Russians "know more about indigenous markets and suppliers, networks and ministries, regulations and cultural patterns, and workforce strengths and weaknesses than a Western manager could learn in years on the job" (p. 45). They reject "the false conventional wisdom" about nonexistence of Soviet successful managers, arguing that many of them were "accomplished wonders" (p. 45). Therefore, successful joint ventures utilized Russian managers' knowledge and skills and introduced Western practices gradually and selectively. Similarly, Welsh and Swerdlow (1992) warn against the assumption that Russian managers have nothing to offer. Due to difficulties and constraints in the Soviet era, managers had to be "creative, resourceful and industrious," so they are good at the "input" side of the equation, such as their ability to acquire goods ...while Westerners ...are better prepared to deal with the "output" aspects of business, such as marketing products" (p. 72).

Training practices. What and how to train Russian employees becomes a challenge. Moscow McDonald's uses the same approach to HRD in Russia as world wide (Vikhanski & Puffer, 1993). The main strategy was hiring teenagers not for economic reasons but due to their openness and lack of prior experience which brings along different habits of work. However, Varner & Varner (1994) suggest a different perspective on training in Russia arguing that "successful training builds on the knowledge base and experiences of the participants" (p. 362). Therefore, training and HRM should take into account the political environment, the existence of the old power elite, people's new awareness of the past due to the political changes, and cultural values, beliefs, and behaviors. Ignoring these issues brings misunderstandings and low effectiveness. Similarly, Thach (1996) calls the use of Western concepts for training Russians a

mistake since “Western concepts as participative management, empowerment, reengineering, and teamwork do not translate immediately” in Russia (Thach, 1996, p. 37).

Training methods should take into account teaching methods utilized in Soviet system of education. Since lecturing dominated and games, icebreakers and role-plays were not used, Russians react to these new methods differently. Training should start with emphasis on basic skills (Thach, 1996). Varner and Varner (1994) note that training in factual knowledge should be combined with experiential learning. Similarly, hard content with concepts foreign for Soviet business, which are often times accounting and finance, seem to be more easily accepted since they do not bring a fear of losing face. While introducing Western concepts, examples should be relevant to employees and the context.

Organizational involvement. Attitude towards involvement in the organization carries characteristics of the Soviet era where state-owned enterprises did not practice meaningful system of worker recognition and employment was state-guaranteed. “They think they’re paying us; let them think we’re working” used to be a common saying (Herman & Messmer, 1994). Searching for individual rather than organization’s profit was also common at both managerial and non-managerial positions (Tongren, Hecht, & Kovach, 1995). A well-known saying, “Take each nail home from the plant; you are the owner, not a guest” reflects the worker disengagement with the organization. In studying the applicability of U.S. theory of human resource management of employee participation to Russian organization, Welsh, Luthans, and Sommer (1993) found that when a plant’s workers were invited to openly discuss ways of their performance improvement without their supervisors present, it had a counterproductive effect, significantly decreasing worker productivity, which can be explained by the existing supervisors’ neglect of worker initiative.

Responsibility. Responsibility represents a core value of the U.S. culture and market economy (May et al., 1998) and is essential to HR managerial principles (Gilley, 2002). In the Soviet times, centralized planning determined the organization’s goals, structure, and development. Since managers did not always have control over the organization and production outcomes, avoiding responsibility became a norm (Cooley, 1997; Proffitt et al., 1997). This system did not encourage risk-taking in solving problems; instead, managers and executives “exhibit an extraordinary ability to ‘pass the buck,’ both personally and professionally” (May et al., 1998, p. 452). Also, Soviet hierarchical organizational structure facilitated collective, rather than individual, responsibility where everyone and no one were responsible (Fey & Bjorkman, 2001). Vlachoutsicos (2001) attributes this diffusion of individual responsibility to the Collective Leadership prevalent in Russian culture and exercised even by the Politburo of the Central Committee of the Communist Party. Collective Leadership led to “the tendency of managers to cover their responsibility by hiding behind collective decisions” (Vlachoutsicos, 2001, p. 166). Though Soviet managers were not held responsible, they were given authority, so Lawrence and Vlachoutsicos (1993) suggest giving Russian managers “the authority they need to take responsibility” (p. 46).

Communication. The concept of feedback takes a central role in the U.S. theory of learning organization, suggesting “everyone shares responsibility for problems generated by a system” (Senge, 1990). In Russian organizations, feedback is limited and information flows primarily vertically. Managers are reluctant to share information with the subordinates and provide feedback. Employees receive messages but do not provide feedback; asking for help or admitting confusion was not encouraged in the Soviet era. The “flawed feedback” may be explained by the mistrust between superiors and subordinates that comes from the Soviet legacy

of “keep your mouth shut” style of working (Cooley, 1997, p. 100). Fey and Bjorkman (2001) attribute this to the high power distance of the Russian culture, a perception of inequality between people and society as a “normal and desirable thing” (Hofstede, 2002, p. 92). Russia’s perception of authority might have historical roots dating back to the 13 century Rus where communities were geographically isolated from the center, which made both the ruler and the people mutually inaccessible (Vlachoutsicos, 2001).

Management/leadership style. Ardichvili et al. (1998) found that half of Russian managers perceived themselves as situation leaders switching from autocratic to democratic methods depending on the context and only one-tenth of them used autocratic methods; however, more than half made decisions alone or consulting only with other managers. Lawrence and Vlachoutsicos (1993) note that Russian managers “practice a unique form of decision making that combines consultation and command by alternating periods of open, widespread discussion of options with moments of strong, top-down authority in making final decisions” (p. 45). Transactional leadership seem to dominate among Russian managers who favor contingent reward method “by stressing specific benefits that their subordinates would receive by accomplishing agreed-on tasks and establishing exchange relationships with them” (Ardichvili & Gasparishvili, 2001, p. 67). Inspirational motivation and intellectual stimulation are also frequently utilized. Managers perceive charisma has the strongest impact on performance but utilize it less than other methods (Ardichvili & Gasparishvili, 2001).

Implications

The small number of articles related to HRD in Russian enterprises, U.S. firms in Russia, or U.S.-Russian joint ventures found in the study did not provide sufficient information that would address the purpose of this paper (i.e., to determine the role and function of HRD practitioners and researchers) and necessitate further scholarly research. Empirical and theory-driven studies should explore broader spectrum of topics discussing them from cultural, political and historical perspectives. Collaboration between U.S. and Russian HRD scholars and practitioners can also enrich knowledge about current practices and challenges and provide grounds to facilitate understanding of culture and work practices and sharing of experiences to develop more effective HRD practices.

References

- Ardichvili, A. (2001). Leadership style and work-related values of managers and employees of manufacturing enterprises in post-communist countries. *Human Resource Development Quarterly*, 12(4), 363-383.
- Ardichvili, A., & Gasparishvili, A. (2001). Leadership profiles of managers in post-communist countries: A comparative study. *Leadership & Organization Development Journal*, 22(2), 62-69.
- Ardichvili, A., Cardozo, R. N., & Gasparishvili, A. (1998). Leadership styles and management practices of Russian entrepreneurs: Implications for transferability of Western HRD interventions. *Human Resource Development Quarterly*, 9(2), 145-155.
- Evans, D. (2001). Time to get down to business with Russia [editorial]. *The Washington Post*, Jul 27, A. 31.
- Gilley, J. W., Eggland, S. A., & Gilley, A. M. (2002). *Principles of human resource development* (2nd ed.). Cambridge, MA: Perseus.
- Cooley, M. (1997). HR in Russia: Training for long-term success. *HR Magazine*, 42, 98-106.

- Fey, C. F. (1995). Success strategies for Russian-foreign joint ventures. *Business Horizons*, 38(6), 49-55.
- Fey, C., Engstrom, P., & Bjorkman, I. (1999). Doing business in Russia: Effective human resource management practices for foreign firms in Russia. *Organizational Dynamics*, 28(2), 69-80.
- Fey, C. F., & Bjorkman, I. (2001). The effect of human resource management practices on MNC subsidiary performance in Russia. *Journal of International Business Studies*, 32(1), 59-76.
- Herman, E., & Messmer, M. (1994). Post-Soviet HR reforms. *Personnel Journal*, 73(4), 41-47.
- Hofstede, G. (2002). Images of Europe: Past, present and future. In M. Warner & P. Joynt (Eds.), *Managing across cultures: Issues and perspectives* (pp. 89-103). London: Thomson Learning.
- Lawrence, P., & Vlachoutsicos, C. (1993). Joint ventures in Russia: Put the local in charge. *Harvard Business Review*, 71(1), 44-54.
- May, R., Young, C. B., & Ledgerwood, D. (1998). Lessons from Russian human resource management experience. *European Management Journal*, 16(4), 447-459.
- Messmer, M. (1994). A U.S.-based Russian company's staffing solution. *Workforce*, 73(4), 48.
- Patton, M. Q. (2002). *Qualitative research and evaluation methods*. (3rd ed.) Thousand Oaks, CA: Sage.
- Proffitt, D., Hill, A., Armstrong, K., & Engel, J. F. (1997). Insights into the behavior of Russian managers. *Business Forum*, 22(2/3), 58-63.
- Rubens, K. (1995). Changes in Russia: A challenge for HR. *HR Magazine*, 40, 70-74.
- Senge, P. M. (1990). *The fifth discipline*. New York: Doubleday.
- Shaw, M., & Ormston, M. (2001). Values and vodka: Cross-cultural anatomy of an Anglo-Russian educational project. *International Journal of Educational Development*, 21, 119-133.
- Shekshnia, S. (1998). Western multinationals' human resource practices in Russia. *European Management Journal*, 16(4), 460-465.
- Stagner, D. (1996). Western business 101 for Russians: Train your Russian staff in American-style management. *The Secured Lender*, 52(4), 40-42.
- Thach, L. (1996). Training in Russia. *Training & Development*, 50(7), 34-38.
- Tongren, N., Hecht, L., & Kovach, K. (1995). Recognizing cultural differences: Key to successful U.S.-Russian enterprises. *Public Personnel Management*, 24(1), 1-18.
- Varner, I. I., & Varner, C. H. (1994). A culture-based framework for successful business in Russia. *Human Resource Management Quarterly*, 5(4), 361-369.
- Vikhanski, O., & Puffer, S. (1993). Management education and employee training at Moscow McDonald's. *European Management Journal*, 11(1), 102-107.
- Vlachoutsicos, C. (2001). Russian Communitarianism: An invisible fist on the transformation process in Russia. In D. Denson (Ed.), *Managing organizational change in transition economies* (pp. 149-209). Mahwah, NJ: Lawrence Erlbaum.
- Welsh, D. H. B., & Swerdlow, S. (1992). Hospitality Russian style: Nine communication challenges. *The Cornell HRA Quarterly*, 33(6), 64-72.
- Welsh, D. H. B., Luthans, F., & Sommer, S. M. (1993). Managing Russian factory workers: The impact of U.S.-based behavioral and participative techniques. *Academy of Management Journal*, 36(1), 58-77.

Critical Reflection on a Faculty Development Research Project

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Abstract: Critical reflection is imperative for the practitioner who seeks to grow and improve in the important work of teaching. This paper is a critical reflection of one author's experience in creating a faculty development initiative.

Dental educators are plucked from the ranks of exceptional clinicians and researchers, with the expectation they are able to facilitate the learning of others. They teach the way they were taught (Centra, 1978): turning out the lights, turning on the slides and telling the class or audience what they do. The expectation is that the telling deposits knowledge in the learner, which translates into skill.

Faculty development is "a tool for improving the educational vitality of our institutions through attention to the competencies needed by . . . teachers and to the institutional policies required to promote academic excellence . . . the goal of faculty development is to empower faculty members to excel in their roles as educators" (Wilkerson & Irby, 1998). Formal faculty development in colleges and universities began in the 1960s. Dental and medical schools were influenced by their parent institutions and explored faculty development as well, although informally and less intentionally (Swanson, 1993). In the early 1990s, The American Dental Education Association, recognizing the need for greater intentionality in teaching, began to sponsor a national faculty development program (Cohen, 1991).

In 1991, Cohen reflected, "We will become more sensitized to the quality of our educational programs (outcomes assessment will force us in this direction anyway) and find that existing resources are insufficient to support our educational needs." (p. 295) Although the trend was clear, the imperative was not. Few dental schools created faculty development programs (O'Neill & Taylor, 2001). As the new Director of Academic Affairs of The Pankey Institute and graduate student in adult education and human resource development, I facilitated a faculty development initiative to implement some of my new learning. The purpose of this paper is to reflect on my experiences as a new faculty member who facilitated the faculty development initiative. These questions guided the reflection (a) With what expectations and assumptions did I begin the faculty development initiative? (b) What could I have done differently to further the development of the faculty? (c) What did I learn about faculty development? (d) What successes, issues, and dilemmas became apparent during the process?

The Situation

The Pankey Institute for Advanced Dental Education provides continuing education for graduate dentists but does not award degrees and is not a dental school. However, faculty is selected similar to dental schools; that is, the most talented clinicians completing the process at the Institute are asked to teach. The criteria for their selection are based on clinical ability, apparent confidence in front of people, and a desire and interest to impact others in dentistry. Faculty development is done on the job and with annual three day faculty development conferences. Faculty consist of four full time in-house faculty and 144 visiting faculty. Visiting faculty teach one to two weeks per year and are otherwise in full time private clinical practice with the exception of a small number who are also full or part time faculty in dental schools. Currently, only two of the visiting faculty have advanced degrees in education.

Faculty Development Initiative

The first step of the process was to have faculty complete the Teaching Perspectives Inventory (TPI) (Pratt & Collins, 2000). The Internet version of the TPI (<http://www.teachingperspectives.com>) was completed by 129 of 144 visiting faculty. Pratt and Collins collated and provided instruction on interpreting the data (personal communication, May 27, 2003). The TPI is an instrument that helps quantify the degree to which one embraces five teaching perspectives: transmission, apprenticeship, developmental, nurturing and social reform (Pratt & Collins, 2000). The second step was to present the TPI data, an explanation of the TPI, and an outline of the five perspectives at the annual Faculty Enhancement Program. The third step was to request that faculty maintain Teaching Logs (TL) (Brookfield, 1995). The teaching log is a set of six self reflective questions that form the basis of an autobiographical account of the individual as a teacher and learner. The last step was to interview the first 12 faculty completing the TPI, TL, and teaching after the enhancement workshop.

Critical Reflection

Brookfield (1990) advises adult educators to develop a “critical rationale” for their teaching. Critical rationale is a set of values, beliefs, and convictions about the essential forms and fundamental purposes of teaching (Smyth, 1986). A critical rationale for teaching guides the educator when faced with dilemmas in the teaching and learning exchange. To develop a critical rationale of teaching, the professional who has moved from the ranks of clinical dentistry with no formal training in educating adults needs a starting point. Brookfield (1995) defines critical reflection in education as having two purposes: to understand power relationships and to question assumptions and practices. The process of critical reflection occurred as the lead author considered each of the four steps immediately upon completion of the steps. These reflections were shared through e-mail exchanges, telephone and in person discussions with the co-author, who participated by asking questions and assisted with raising awareness of assumptions and the place of power in this process. These reflections have also impacted our personal teaching practices, and how we teach adults to teach. My story (lead author) of becoming a teacher and moving towards being a critically reflective teacher is presented first; a reflection on the faculty development process follows.

My Journey Towards Becoming a Critically Reflective Teacher

I have been passionate about teaching since 1995 when I was asked to join the visiting faculty of The Institute. The appointment came with a certain amount of prestige in the dental profession and was made because I had demonstrated leadership, clinical expertise, and confidence. The appointment came with three challenges: (a) my continued learning in dentistry, (b) an expectation to act as a leader, and (c) facilitation of participants’ learning. A not yet articulated fourth challenge became evident over time--I needed to move past what Brookfield (1995) calls “The Imposter Syndrome,” the unvoiced fear of not being worthy of this position. My feeling of being unworthy stemmed from the fear that students would find out how little I really knew. Teaching was more about recognition for me at that point than it was about connecting with students. Considering a rationale of teaching did not occur to me; my understanding of teaching was more about show and tell than it was about facilitating learning.

Poor evaluations from students quickly caught my attention. I sought out people who had mentored me to discuss ways to improve my teaching. Improving the evaluations was paramount, and I worked to improve my presentations and PowerPoint skills because that’s what I considered to be the essence of good teaching. Improved confidence in those abilities resulted in better evaluations and a certain degree of smugness. Simultaneously, a mentor joined me in

facilitating small study club workshops in my office. The smugness evaporated when I saw him pull participants into the learning process, creating mountaintop experiences without a lecture or a slide. When pushed to help me do what he was doing, he told me to go study how people learn.

Without the benefit of exposure to adult education literature, I turned to what I knew best: reflecting on my own most profound learning experiences, reading literature based in psychology, reading popular “how to” books and asking people I respected as educators how they created successful teaching experiences. In retrospect, I believed that whatever learning took place in my presence was my responsibility.

I continued to work with small groups and at the same time started to write about how my practice had grown and developed over my career. The experience of writing articles others would read became a form of journaling for me. Coalescing singular experiences in my practice into learning patterns then writing about those patterns led me to understand how I learned best. When I was in the company of individuals who could challenge my thinking and help me find my own solutions to problems, I stayed engaged. I learned the most when I was the one who defined what I wished to learn. When I focused on learning defined by other people, I lost focus.

After joining the Institute as full time faculty in 2002, full time teaching, curriculum development, and faculty development became my primary roles. Part of the employment agreement was to pursue a graduate degree in education. Early in graduate school I was exposed to Pratt’s *Five Perspectives on Teaching in Adult and Higher Education* (1998). This work resonated with me. When I began to relate to students as designers of their learning, they began to respond to me differently and their successful implementation of concepts increased. Reading Arseneau and Rodenburg’s (1998) chapter, *The Developmental Perspective: Cultivating Ways of Thinking*, became a major milestone in my growth as an educator. There were words to concepts I was trying to formulate and I got so excited that I couldn’t sleep. At 3AM I tracked Arseneau down on the Internet and e-mailed him, detailing how I was sensing that my relationships with the students were far more important than any content knowledge.

To my surprise, (I am still in awe of those who write books) he responded immediately and directed me to the TPI web site. I did the instrument and asked the rest of the full time faculty at the Institute to participate as well, just to see what we would discover. John Collins emailed wondering who we were and his query started an e-mail relationship with both Dan Pratt and himself. As I shared my excitement with Tonette Rocco, the professor who assigned the book in class, she suggested some research possibilities and that I begin to read Brookfield’s work. With Brookfield’s (1995) guidance on becoming a critically reflective teacher, and enlisting the help of Rocco, Collins, and Pratt, the process of the faculty development initiative began.

The Forced March: Reflections on the Faculty Development Initiative Process

Coming to an understanding of how I processed my excitement and translated it into action has been an education unto itself. What follows is a discussion of how I created an initiative based on my own learning agenda and how that led to assumptions and expectations that I did not see for myself until undertaking the process of writing up the research.

Assumptions and expectations. My interest in helping faculty develop came from my own desire to excel at teaching. I knew from my own experience as a visiting faculty member that I desperately wanted help in developing as a teacher; however, there was no system in place for that to happen. After observing colleagues struggle with issues and feelings that I experienced, my curiosity and need to help them grew. I made several assumptions about the faculty and the

process. I assumed all faculty wanted further development as teachers. I also assumed that because I was so excited about the TPI that once the faculty was exposed to the TPI, their excitement would equal mine. I sent an e-mail to the faculty expected to attend the workshop outlining the process and suggesting they read Pratt's book. I further assumed that I was clear in my communication about how the process would work and what the benefits would be, and because I was sure I was so clear, I assumed the faculty would be quick to ask for further workshops on teaching perspectives and methods.

I started the lecture believing that I had a very clear direction to guide the faculty through understanding the TPI and their individual results. I assumed they all participated willingly and with their own interests in mind. I was sure they had all read through the supplemental information supplied on the Web site and that they would rush to buy Pratt's book. My assumptions were flawed on several levels. First, I am in a position of power relative to the visiting faculty. I have influence on their future as faculty members at the Institute. Second, looking back, my understanding is that many if not most of the faculty participated in the TPI, not because they wanted to learn about themselves, but because they thought it was important to me, the Institute, or to their future with the Institute. There was some interaction during the lecture, more afterwards, and still more via e-mail in the weeks following. Faculty were interested in their results, but some saw the instrument as a test, and were concerned that it was being used to evaluate them, rather than as a snapshot of where they were at a point in time.

After thinking about the "test" response, I realized that I had failed to provide sufficient context for the faculty prior to their completing the instrument. Following the lecture, some wondered what purpose the TPI and the workshop served. This probably should not have surprised me; the lecture served as an introduction to a new topic that required a shift in thinking and learning a new vocabulary and again, I had provided minimal context. I assumed that because I told them what the instrument was and how I would use it, that they all heard and understood me. I was disappointed by the lack of excitement about a self-discovery process that had potential to enhance professional growth. My assumptions got in the way of my chance to be effective. It is ironic that during a workshop on perspective, I got caught by my own teaching and learning perspectives and let them color my ability to honor the different learning styles of the faculty.

Successes and dilemmas. Teaching logs turned out to be unexpectedly popular with the faculty. The questions forced them to focus on the experience of teaching throughout the week, rather than the mechanics of teaching and their evaluations by the students. I discovered for themselves those "AHA" moments when they realized how their actions impacted student learning. When I was in their shoes, I was hungry for feedback on how I was doing. Faculty see the teaching log as providing a source of that feedback, especially since they were asked to return them to me and then to participate in a discussion about what they learned. I still see that in myself, I want feedback, reassurance, guidance, and affirmation that I am on the right path. Recognizing it in others creates a profound sense of responsibility to provide that support for those whom I am charged with developing and leading.

Rubin and Rubin define culture as "how people interpret the world around them by developing shared understandings" (1995, p. 20). Coming from the same culture, I shared what Schein (2002) calls *tacit understanding*, that body of information that permeates a culture but is not written or even talked about, so thoroughly is it embedded. I had in-depth understanding of what the participants were experiencing in their teaching, and made assumptions that may not have been accurate. Follow-up questions that could have been asked were missed because of this

assumed understanding. Not only did I have intimate knowledge of the existing culture, but I was also in a power position relative to those interviewed. I had influence over whether or not they continued to teach at the Institute. I am sure that the power relationship invaded the process and inhibited it.

Gratifying, however, was the response from those who participated in the interviews. One person said:

I think the reviews have to be structured differently than they have been in the past. Not just to get a simple response from the students, but to really have more meaningful feedback, such as what you're doing here, for us to reflect on the experience, for us to talk about the Institute's perception of what we've done.

I have a deeply held belief that teaching is about relationships and connection and think most developmental processes are this way. The interview was affirming in that regard; the faculty will be more successful if there is always someone at the Institute who is interested in their development and committed to their success.

Insights

As I started my new job and brought additional resources to the Institute, it was clear that our faculty wanted to be developed. They wanted help in becoming better at what they do, they wanted recognition for their work and efforts and they wanted a personal relationship with a "supervisor." It was also clear that previous time constraints, demographics, and budget were challenges to making those changes occur.

Analysis of the situation, creation of a plan, and development of measurements and reassessment strategies are foundational to strategic planning. Our process is fundamentally sound but needs improvement. The interview will be rewritten and the faculty are being encouraged to retake the TPI and seek individual consultation to process the results. Changes have been instituted as a direct result of the interviews. Visiting faculty are contacted four months prior to their teaching dates to apprise them of course modifications; they meet with a resident faculty member each morning prior to class beginning for a daily "huddle" to assess the previous day and plan for the current day. At the end of the week, they spend an hour with resident faculty reviewing what went well, what didn't go well, and what could be added or changed in the course. Individuals benefit by receiving immediate feedback and the Institute benefits from additional input about course offerings that allow resident faculty to improve their planning process. The immediate result is an improved sense of community among the faculty, a feeling of recognition for their efforts and for their input, and a closer working relationships with the resident faculty.

References

- Brookfield, S. D. (1990). *The skillful teacher*. San Francisco: Jossey-Bass.
- Brookfield, S. D. (1995) *Becoming a critically reflective teacher*. San Francisco: Jossey Bass
- Centra, J. A. (1978). Types of faculty development programs. *Journal of Higher Education*, 49(2), 151-62.
- Cohen, P. A. (1991). The future of faculty development in dental education. *Journal of Dental Education*, 55(5), 295-8.
- O'Neill, P. N., & Taylor, C. D. (2001). Responding to the need for faculty development: A survey of U.S. and Canadian dental schools. *Journal of Dental Education*, 65(8), 768-76.
- Kember, D. (1997). A reconceptualization of the research into university academics' conceptions of teaching. *Learning and Instruction*, 7(3), 255-75.

- Pratt, D. D. (1992). Conceptions of teaching. *Adult Education Quarterly*, 42(4), 203-20.
- Pratt, D. D. (2002). Good teaching: one size fits all? In *An Up-date on Teaching Theory*, Jovita Ross-Gordon (Ed.), San Francisco: Jossey-Bass.
- Pratt, D. D. et al. (1998). *Five Perspectives on Teaching in Adult and Higher Education*. Malabar, FL: Kreiger.
- Pratt, D. D., & Collins, J. B. The Teaching Perspectives Inventory (TPI). *AERC 2000: An International conference. Proceedings of the Annual Adult Education Research Conference: 41st, Vancouver, Canada, June 2-4, 2000*, 346-55.
- Ratcliff, S. & Rocco, T. (2003). *The Teaching Perspectives Inventory and Teaching Log as tools to inform faculty development*. Unpublished manuscript, Florida International University.
- Schein, E. H. (1999). *Corporate culture: A survival guide*. San Francisco: Jossey-Bass.
- Schon, D. A. (1983). *The reflective practitioner: How professionals think in action*. New York: Basic Books.
- Swanson, A. G., & Anderson, B. M. (1993). Educating medical students: assessing change in medical education--the road to implementation (ACME-TRI). *Academic Medicine*, 68(6), S17-21.
- Wilkerson, L., & Irby, D. M. (1998). Strategies for improving teaching practices: A comprehensive approach to faculty development. *Academic Medicine*, 73(4), 387-95.

Intrusive Community Noise Negatively Impacts South Florida Residents

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Abstract: This study investigated how intrusive noises affect local university students in their communities. The Community Noise Survey solicited information about types of bothersome noises, how often these noises were bothersome, activities intruded upon by these noises, feelings elicited by noise intrusions, and what participants did to abate the noises.

Noise pollution in South Florida has become a pervasive issue in recent times due to an increase in population that has led to an expansion of local airports, increased traffic and construction. Noise pollution is defined as unwanted noise (Berglund & Lindvall, 1995) and has been shown to have negative psychological and physiological effects on those affected most (Blomberg, 2000; Bronzaft, 1998; Staples, 1996). Recent literature has indicated that airplane noise pollution was the most intrusive by those surveyed (Staples, 1996). Noise pollution legislation was passed in the 1970's but was repealed in the early 1980's, and the problem has not been revisited, mostly due to lack of political and financial support (Bronzaft, 1998; Staples, 1996; Suter, 1991).

Noise pollution regulation responsibilities have fallen to the Environmental Protection Agency (EPA) (Staples, 1996; Suter, 1991). Current literature implies that the EPA is unwilling to regulate or punish businesses and the travel industry for fear of political and financial ramifications (Blomberg, 2000; Bronzaft, 1998). Not until recently has the government issued regulations for aircraft companies and airports (Bronzaft, 1997; Suter, 1991). Locally, Miami International Airport receives over 1,400 flights daily and has installed a noise monitoring system, a noise barrier, and has re-scheduled flight paths to reduce flight noise in residential areas (Miami International Airport, 2003). Studies have shown that residents affected by flight paths suffer from psychological and physiological ailments such as stress, high blood pressure and cholesterol levels, and lower immune systems. Research has demonstrated that children living in these areas are affected by intrusive community noise and are on the lower range of the academic grading scale, including lower reading levels (Bronzaft, 1997, 1998; Staples, 1996; Suter, 1991).

Local governments in South Florida have initiated legislation to reduce noise pollution in residential areas. The city of Coral Gables enforces strict constraints on community noise levels and Miami Dade County ordinances limit noise levels as well. These ordinances restrict times when heavy machinery is allowed to operate and noise levels in homes that may be annoying to neighbors including pets, parties, and television and audio decibel levels. Ordinances like these in South Florida and other areas nationwide were established to curb noise levels and create noise civility among residents (Blomberg, 2000).

Noise pollution affects us all whether we are aware of it or wish to acknowledge it. Airplane traffic, construction and local ground traffic all contribute to frustration and anger experienced by residents. Sounds emanating from cranes, cement mixers, welding, hammering, and other work processes are the most frequent construction offenders. Construction equipment is often poorly silenced and maintained, and building operations are sometimes carried out without considering the environmental noise consequence (Berglund & Lindvall, 1995).

Although construction is a major complaint among residents, traffic seems to garner just as many complaints (Suter, 1991). Trucks, buses, motorcycles and cars generate almost all of noise pollution attributed to traffic. Suter (1991) describes narrow streets lined with tall buildings in a so called canyon effect in which the traffic noise is amplified and reverberates [Author: this needs page number. Editor: Page number is only required for direct quotes.] Since South Florida is continually growing and a major hub for international travel, noise pollution is a part of daily life. The objective of the study was to identify intrusive noises, intensity of the intrusion, interference with daily activities, emotional responses to the intrusive noise, and action taken for abatement of the noise in South Florida residents.

Methods

Participants

Potential participants were randomly selected from Florida International University (FIU) students to reflect the points of view of a diverse student population. The Community Noise Survey was completed by 119 participants, of which 54.7% were female and 45.3% were male. Ages ranged from 18 to 31 years old with a mean age of 21.7 ± 2 years. The majority of respondents resided in the FIU area (18.6%), on FIU campus (17.7%), Hialeah/Miami Lakes area (14.2%), Kendall (13.3%), and Broward or Palm Beach (10.6%) counties (see Tables 1 and 2).

Community Noise Survey

The Community Noise Survey was originally developed by the League for the Hard of Hearing International Noise Awareness Day steering committee (Bronzaft, 2000). The seven-question survey solicited the following information: types of bothersome noises, how often these noises were bothersome, the activities intruded upon by these noises, feelings elicited by noise intrusions, and what participants did to abate the noises. The survey included Likert-type and open response type questions.

Procedure and Data Analysis

Institutional Review Board approval was obtained prior to study implementation. Participants completed the survey as part of a study investigating how obtrusive noises affect local university students in their communities. Classes surveyed were randomly chosen to reflect a diverse participant population. Professors were contacted and provided access to survey their class. The survey was conducted at the beginning of class and required approximately three to five minutes. Data were tabulated and analyzed using cross tabulation and rank ordering. Statistical software used was SPSS 11.0 (SPSS, Inc. Chicago, IL).

Results

Bothersome Noises

The survey listed 20 specific noises, and participants were asked to identify how frequently certain noises were bothersome on a 5-point Likert scale (1 = Never, 2= Rarely, 3= Some of the time, 4= Most of the time, and 5 = All the time). We combined the percentages of participants that reported being affected by the intrusive noises some of the time, most of the time, or all of the time for the Likert based questions. Gardening and lawn equipment use (58.9%) were ranked by the majority of respondents as bothersome at least some of the time, while car alarms (49.6%) and car and truck noises (47.1%), were ranked second and third most bothersome. Honking (40.3%), barking (39.7%), and noise (35.7%) were ranked fourth, fifth, and sixth respectively. Participants ranked recreational vehicles and restaurants least bothersome.

Activities Intruded Upon

The survey listed six activities potentially intruded upon by community noises. An open response question allowed participants to add their own activities intruded upon by community

noise to the list. Participants were asked to select all intrusive community noises that affect activities of daily living. A majority of participants reported that noise interfered with sleep (53.0%), work/study (41.9%), and ability to keep the windows open (18.8%). A combined 28.8% complained about noise interfering with listening to radio and television, talking on the phone, or holding a conversation.

Feelings Elicited by Noises

The survey identified six emotional responses to noise and participants were instructed to identify multiple responses, if applicable. Two open-ended questions allowed participants to identify a specific illness or a feeling not listed. The majority of participants (69.2 %) reported feeling annoyed by community noise. Feelings reported equally by participants were angry and upset (15.4 %), followed by helpless (6.0%), overwhelmed (3.4 %), and made physically ill (1.7 %).

Taking Action to Abate Noise

Participants were asked whether they had ever filed a noise complaint and, if so, to specify the type of noise, the response to the complaint, how quickly the response came, and whether the complaint lessened the noise. Few participants (6.0%) reported that they had filed noise complaints with the police or governmental agency. Of the participants who reported that a complaint was filed, the majority was males (71.0%) and most complained about music or parties (71.0%) and helicopter noise (7.0%). A majority (86.0 %) of participants received a response to the complaints and 57.0% had the problem resolved.

Differences among Participants

Age. Respondents ages were categorized into 18 - 22 years old (78.2 %), 23 - 29 years old (19.1 %), and 30 years or older (2.7%). Noise was most likely to interfere with the ability to study or work in 18-22 year olds. Respondents between the ages of 18-22 were most likely to be bothered by garden equipment noise (44.5%), car noise (41.8%), and car alarms (39.1%).

Gender. The majority of participants surveyed were women (54.7 %) and men constituted 45.3 % of the participant population. Males were significantly more bothered by radio and television noise.

Residential locale. Half of the participants living on campus or the FIU area were bothered by car alarms and garden equipment noise equally. Garden equipment noise also bothered participants living in Hialeah/Miami Lakes (75.0%) and Kendall (80.0%).

Complainant vs. non-complainant. Although the majority of the participants were women, men were more likely to file a formal complaint (71.0%). Also, women reported car noise (60%) and city services (64.8%) as more bothersome than did men.

Discussion

The objective of the study was to identify bothersome intrusive community noises that affect South Florida residents. Garden and lawn equipment noise was identified as the most bothersome community noise by respondents of the Community Noise Survey. Participants also reported that intrusive noises interfered with sleep, work and studying. Although noises were mostly found to be annoying, 94% of respondents did not file formal complaints.

A nationwide community noise survey (Bronzaft, 2000) included 647 respondents and found car noises to be most bothersome. In contrast, South Florida residents complained mostly about garden and lawn equipment noise as the most bothersome. Our survey results revealed that residents of six of nine neighborhoods found garden and lawn equipment noise to be bothersome. This finding may be attributed to the lush tropical landscape common in South Florida, which receives 50 inches of rain annually, with 70% falling between June and October (Obeysekera &

Stoieff, 1999). To keep up with all the foliage growth, many communities have landscaping services with loud commercial gardening equipment contributing to the intrusive community noise problem. The landscaping companies begin work at early hours and continue through the day. Noise emitted by landscaping machinery appears to interrupt residents' ability to sleep, work, and study. After gardening equipment noise, South Florida residents complained about car related noises.

Trucks, buses, and cars generate almost all of noise pollution attributed to traffic. Consistent to Bronzaft's (2000) results, we found that at least 40% of our respondents found the following community noises to be intrusive: car alarms, car and truck traffic noise, and honking related noises. Although Bronzaft identified motorcycle noise second and aircraft noise third, our respondents were less likely to complain about these noises. In our study, South Floridians ranked motorcycle noise 13th possibly due to the lack of motorcycle riders in the area. Aircraft noise was ranked 7th most bothersome by South Floridians perhaps due to noise abatement efforts by local airports, which have reduced the noise pollution created by aircraft traffic.

Emotional responses to noise pollution, especially annoyance, were experienced by the majority of participants. Contrary to popular belief, on the average, men (20.7%) were more likely than women (16.6%) to emotive feelings about the noise affecting them. Men outscored women in every category of emotion except being made physically ill. Notably, men tended to be more annoyed, angry, helpless, and upset. These emotions can lead to a reduced quality of life (Bronzaft, 1998; Suter, 1991), including the inability to enjoy hearing music, watching television, studying, or enjoying time outside. Sleep, work and study ranked highest among activities intruded upon by noise. Our survey revealed that over 50% of students living on campus complained about noise created by their neighbors, perhaps due a combination of the close proximity, thin walls, and late studying hours.

One of the limitations of this study was that 80% of the respondents were under the age of 23. Although this study does not encompass a spectrum of age groups, it does illustrate that the younger population is also bothered by loud noise. Most other studies (Bronzaft, 2000) have focused on the larger population, an older population, and received similar results. The largest inconsistency between the current study and Bronzaft (2000) was within the younger population's reluctance to call authorities and complain about the surrounding noises. Of the 119 participants in the current study, only 7 participants made formal complaints about noise pollution in their communities, with 5 of the complaints resulting from loud music or parties. Bronzaft's study (2000) showed that 40% of respondents complained to authorities about noise pollution in comparison to the 6% our study revealed. Our results were in agreement with the 5 to 10 % of noise complainants estimated by Berglund and Lindvall (1995).

The explanation offered is our subjects, being of college age, are probably more used to loud noises and may even try to even the noise level affecting them by raising the volume of their television, radio or conversation instead of filing a formal complaint. On the other hand, Bronzaft's (2000) subjects had a mean age of 43 years, might be less likely to tolerate such loud noise due to their age and insistence on "peace and quiet." A student's day may not end until late at night, while an older adult might go to bed earlier due to an early rise. These are all factors that may be considered when concluding why our subjects had such a low complaint response.

Comments made by 12 of the 21 participants indicated that the participants did not have many problems with noise and say that they live in a relatively quiet neighborhood. University campus residents or those living in the FIU area experienced the most noise pollution. Residents

of Kendall, Coral Gables, Hialeah/Miami Lakes, South Miami, Broward/Palm Beach residents claim noise pollution is not an issue in their communities. The cities with very little noise pollution complaints were dispersed throughout the tri-county area and are known for being residential, commercial, and industrious cities. Although our participants claim not to be affected by noise pollution, reports have found that the average noise level outside an urban apartment can be 1,000 times more intense than in a rural residential neighborhood but is perceived like an eight-fold increase (Suter, 1991).

This study aimed to report on how noise affects young South Florida residents and confirmed many of the findings of previous studies that noise pollution affects people of all ages and location. The most bothersome noise, garden and lawn equipment noise, was attributed to the preponderance of trees and greenery in South Florida. The young population provided an insight as to the feelings, complaints, and quality of life noise pollution plays in their lives. The results have shown that activities of daily living are continually interfered with by a preponderance of environmental noises. These effects of these noises have long reaching consequences, including physiological and psychological consequences (Bronzaft, 1997, Suter, 1991). Further research and programs that increase awareness can identify the implications of noise pollution and may allow for the possibility of future legislation.

References

- Administrative Conference of the United States. (1991, November). Suter, A.H. Noise and its effects. *Noise and its effects*. Retrieved October 21, 2003 from <http://www.nonoise.org/library/suter/suter.htm#>
- Berglund, B. & Lindvall, T. (1995). Community noise. *Archives of the Center for Sensory Research*, 2(1), 1-195.
- Blomberg, L. (2000). Noise, sovereignty, and civility. *Hearing Rehabilitation Quarterly*. Retrieved September 20, 2003 from <http://www.lhh.org/hrq/25-1/noise.htm>
- Bronzaft, A. L. (1997). Aircraft noise: the ailment and the treatment. *Hearing Rehabilitation Quarterly*. Retrieved September 19, 2003 from <http://lhh.org/hrq/noise/aircraftnoise.htm>
- Bronzaft, A. L. (1997). Beware: noise is hazardous to our children's development. *Hearing Rehabilitation Quarterly*. Retrieved September 19, 2003 from <http://www.lhh.org/hrq/22-1/beware.htm>
- Bronzaft, A. L. (1998). A voice to end the government's silence on noise. *Hearing Rehabilitation Quarterly*. Retrieved September 19, 2003 from <http://www.lhh.org/hrq/23-1/voice.htm>.
- Bronzaft, A. L. (2000). Intrusive Community Noises Yield More Complaints. *Hearing Rehabilitation Quarterly*. Retrieved September 19, 2003 from <http://www.lhh.org/hrq/25-1/intrusive.htm>.
- Charter and Code for City of Miami. (June, 2003). Retrieved September 22, 2003 from http://fws.municode.com/CGI-BIN/om_isapi.dll?infobase=10933.nfo&record={2BE8}&softpage=newTestMainnonFrame.
- City of Coral Gables. A Citizens guide to code enforcement. Retrieved September 22, 2003 from <http://www.citybeautiful.net/pdf/CodeEnforcement.pdf>.
- Miami International Airport (2000). Plane facts about aircraft noise. Retrieved September 22, 2003 from http://www.miami-airport.com/html/noise_abatement.html#.

- Obeyskera, J & Stoieff, L. (1999). *How are we going to adequately meet the increasing and competitive needs for water by the natural, urban, and agricultural areas?* Poster presented at the South Florida Restoration Science Forum. Retrieved September 22, 2003 from <http://sofia.usgs.gov/sfrsf/rooms/hydrology/compete/>
- Staples, S. (1996). Response to environmental noise: Psychological research and public policy. *American Psychologist*, 51 (2), 143-150.
- Suter, AH. (2002). Construction noise: Exposure, effects, and the potential for remediation; A review and analysis. *American Industrial Hygiene Association Journal*, 63, 6, 768-789.

Table 1
Participants' Neighborhood

| Neighborhood | Participants | Percent Reporting |
|---------------------|--------------|-------------------|
| FIU Campus | 20 | 18.6 |
| FIU Area | 21 | 17.7 |
| Hialeah/Miami Lakes | 16 | 14.2 |
| Kendall | 15 | 13.3 |
| Broward/Palm Beach | 12 | 10.6 |
| Coral Gables | 11 | 9.7 |
| City of Miami | 8 | 7.1 |
| South Dade | 7 | 6.2 |
| North Dade | 3 | 2.7 |

Table 2
Regional Neighborhoods for Purpose of Data Analysis

| Region | Neighborhood |
|---------------------|---|
| FIU Area | Westchester, Unincorporated Dade, Fontainebleau, Doral, Sweetwater, West Dade |
| Hialeah/Miami Lakes | Hialeah, Miami Lakes |
| Kendall | Palmetto Bay, Snapper Village, Pinecrest |
| Broward/Palm Beach | Ft. Lauderdale, Miramar, Pembroke Pines, Plantation |
| Coral Gables | Miami, Shenandoah |
| South Dade | Perrine, Cutler Ridge, Homestead, Country Walk |
| North Dade | North Miami |

Cognitive Performance May be Impaired by Exercise in a Hot, Humid Environment: A Preliminary Investigation

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Abstract: The purpose of this study was to examine the effects of acute active dehydration by exercise in a hot, humid environment on cognitive performance. Our findings were inconclusive compared to previous studies that reported decreased cognitive performance in manual laborers and military personnel working in extreme environmental conditions.

Dehydration, or the loss of body water, negatively affects physical performance (Sawka, 1992). Limited research (Cian, Barraud, Melin, & Papel, 2001; Cian et al., 2000; Gopinathan, Pichan, & Sharma, 1988; Sharma, Sridharan, Pichan, & Panwar, 1986) suggests that cognitive performance may also be impaired; however, methodological flaws limit the applicability of these findings to the physically active population. Normal cognitive function is important for peak sport performance, particularly during high speed, high risk sports such as football, soccer, rugby, or auto racing. Small decrements in one or more components of cognitive performance such as concentration, attention, reaction time, and cognitive processing speed may affect individual and team performance and may predispose an individual to injury.

A recent literature review (Sawka, 1992) establishes that dehydration commonly ranging between 2 – 8% body weight loss negatively impacts physical performance by decreasing muscular strength, power, and endurance. Previous studies (Jimenez et al., 2002; Weiskopf et al., 2000) have demonstrated that exercise in the heat commonly results in moderate dehydration of 3 – 4% of body weight loss. During moderate dehydration, plasma volume is diminished by as much as 17%, resulting in decreased stroke volume and cardiac output and inducing cardiovascular strain. Although clinicians are trained to identify mental confusion, impaired memory, or reduced attention as signs of dehydration (Cian et al., 2000), limited understanding of the physiological mechanisms causing these mental deficits exists. It is possible that this reduced blood volume results in decreased the blood flow through the brain resulting in some level of cognitive impairment. Increased levels of the stress hormone cortisol have been reported during dehydration and may be related to impaired cognition and memory functions (Weiskopf et al., 2000). Unfortunately, the physiological mechanisms explaining the cognitive impairments associated with dehydration remain largely theoretical.

A paucity of studies examining subjects' cognitive performance before and after dehydration exists and no studies to our knowledge examine athletes. Initial results suggest that dehydration negatively affects mental performance (Cian et al., 2000; Gopinathan et al., 1988; Sharma et al., 1986) in manual laborers, military personnel, and volunteers dehydrated up to 5% body mass loss. Previous studies have demonstrated that cognitive performance impairment was proportional to the degree of dehydration and significant differences were found at 2 – 3% dehydration for all neuropsychological tests administered. Peak sport performance in extreme environments is more demanding and requires more physical resources than occupational activities. The physically active population has not yet been studied and few studies have used the latest technological advances in neuropsychological testing to identify the effects of active dehydration by exercise in a hot, humid environment on cognition. Therefore, the purpose of

this study is to identify the effects of dehydration on cognitive performance in physically active individuals using an Internet-based neuropsychological testing system.

Method

Research Design

Physically active males were tested before and after performance of a heat stress trial constituting a within subjects test-retest design. We measured cognitive performance on the Headminder™ Cognitive Stability Index (CSI) test in ten participants in two physiological conditions: euhydrated (normally hydrated) control condition and dehydrated (fluid deficit) experimental condition. The day prior to testing, each participant attended a familiarization session during which he was instructed on the proper use of a computer keyboard and mouse, familiarized with the Headminder™ CSI test, and baseline anthropometric measures were recorded. The following day, each participant reported to the Florida International University (FIU) Sport Science Research Laboratory wearing an athletic supporter, mesh shorts, a cotton t-shirt, sweat socks and running shoes. Each participant was asked to completely void urine and body mass data was recorded using a digital calibrated physician's scale. A euhydration body mass was confirmed at less than $\pm 1\%$ (or 0.4 kg) of baseline body mass. Each participant was then administered the euhydrated condition Headminder™ CSI test. Results were recorded, and each participant performed the heat stress trial consisting of 45-120 min of treadmill exercise in a hot and humid environment with limited fluid intake.

Immediately following the exercise trial, participants removed all clothing and towel dried for measurement of dehydrated condition nude body mass. After achieving the target body dehydration of a minimum of 3% body mass decrease, the recovery period consisted of participants relaxing in an air-conditioned environment to allow the effects of heat exposure and exercise to subside. The dehydrated condition Headminder™ CSI test was then administered, and results were recorded. Physiological measures were recorded throughout the study (e.g. heart rate, body temperature, blood pressure). At the conclusion of the data collection session participants were required to orally rehydrate with cool water until they returned to within 2% of their pre-exercise body mass.

Participants

Prior to participation in the study, potential participants completed a health history questionnaire and informed consent form approved by the Institutional Review Board. Participants were 10 healthy male volunteers (mean age = 25.6 \pm 1.6 years, weight = 80.3 kg \pm 4.3 kg) recruited from FIU and the surrounding community who had no history of heat-induced illness or head injury within the past year. Participants were screened for use of prescription medications, history of neurologic illness, and any motor or sensory impairment that would prevent reliable operation of the computer. Males were selected to reduce the variability of ovarian hormone levels and substrate utilization between genders during exercise (Cleary, Kimura, Sitler, & Kendrick, 2002). During a familiarization session the day preceding testing, participants were instructed to abstain from ingestion of alcohol, caffeine, non-prescription medication, and dehydrating behaviors (sauna, diuretics, sweat suits, etc.) for the duration of the study.

Instruments and Procedures

Mood ratings. Motivation and fatigue were assessed prior to each administration of the Headminder™ CSI test to identify confounding variables that may have affected cognitive performance on the Headminder™ CSI test. Motivation level was determined by administering a visual analog scale designed to present to the respondent a rating scale with minimum constraints

(Hocking, 2001). The visual analog scale consisted of a 13 cm line with the left side labeled “No Motivation At All” and the right side labeled “Highest Possible Amount of Motivation.” Participants marked the location on the line corresponding to the amount of motivation experienced at that time. The mark on the line was measured from the left to the nearest 0.1 cm and recorded for data analysis. Fatigue severity was determined using a question reading “At this moment what is your severity of fatigue?” with a 9-point Likert scale response. The response scale consisted of 1 = not at all, 3 = mild, 5 = moderate, 7 = severe, 9 = worst imaginable.

Cognitive performance testing. Participants were tested on the Headminder™ CSI computerized cognitive test administrator (Headminder Inc., New York, NY). The Headminder™ CSI test is a 30-min internet-based test including: (a) questions about patient background, pertinent medical history, and computer familiarity; (b) neurocognitive subtests of reaction time, processing speed, memory, and attention/executive functioning; and (c) an optional mental status examination completed at the investigator’s discretion. These cognitive tests are designed to detect statistically significant, clinically meaningful change in central nervous system functioning. All tests are administered and scored online via an Internet browser and results are accessible only to the test administrator who is responsible for interpreting and discussing test results with the participant. The Headminder™ CSI is designed for routine monitoring of healthy and/or at-risk individuals for detection of significant changes in memory, executive, or other cognitive functions consistent with various neurologic conditions. Using this “baseline” model, in which an individual’s scores are compared to his/her own prior scores, even relatively small decreases in cognitive function can be identified as statistically significant. (Headminder, 2002)

The Headminder™ CSI is highly reliable and has concurrent validity with paper-and-pencil-type neuropsychological tests. The intra-test correlations for each of the moderately independent cognitive factors are: response speed $r = .80$, processing speed $r = .78$, memory $r = .68$, and attention $r = .73$. Cognitive factors and subtests measure of reaction time, processing speed, memory, and attention/executive functioning have moderate to large concurrent validity (ranging from .30 to .74) with the trail making test, symbol digit modalities test, symbol search, Bushke test, and digit span test. Current cognitive functioning on the Headminder™ CSI was reported as raw scores for response time on each of the subtests were used for data analysis.

Statistical Analysis

Statistical analyses were conducted on the participants’ mood ratings and cognitive performance response time raw scores. Dependent t-tests were used to identify differences between the euhydrated and dehydrated conditions on raw scores of processing speed, response speed, memory, and attention and each associated subtest. Dependent t-tests were also used to analyze the hydration measures before and after the heat stress trial and recovery. Data were analyzed using the SPSS 11.0 for Windows Statistical Package (SPSS, Chicago, IL). Significance was set at $P \leq .05$ for all statistical analyses.

Results

Mood ratings. Participants rated motivation and fatigue prior to each cognitive performance test. Motivation ratings were not significantly different ($t_9 = 2.181$, $P = .057$) between conditions; however, motivation ratings did reveal a 17.86% decrease from the euhydrated (8.4 ± 1.8 cm) to the dehydrated condition (6.9 ± 2.9 cm). Fatigue severity ratings were significantly ($t_8 = -5.774$, $P = .001$) increased 62.48% from the euhydrated (2.00 ± 1.41) to the dehydrated (5.33 ± 1.73) condition.

Cognitive performance measures. Cognitive performance consisted of four factor scores with associated subtest response times (Table 1). The Headminder™ CSI processing speed factor composite raw score means revealed a significant ($t_9 = -3.329, P = .009$) 8.33% decrease (improvement) in the dehydrated condition ($2.78 \pm .43$) compared to the euhydrated condition ($3.03 \pm .32$). The symbol scanning subtest response time was significantly ($t_9 = 6.692, P \leq .001$) decreased 16.16% in the dehydrated ($3.16 \pm .57$ ms) compared to the euhydrated ($3.76 \pm .17$ ms) condition. No other factor scores were significantly different between the euhydrated and dehydrated conditions. The response direction 1 response time was significantly ($t_9 = 6.692, P \leq .001$) increased 4.59% in the dehydrated ($.54 \pm .01$ ms) compared to the euhydrated ($.51 \pm .01$ ms) condition. Although not significant ($t_9 = 2.257, P = .051$), the response direction 2 response time was decreased 5.05% in the dehydrated ($.63 \pm .08$ ms) compared to the euhydrated ($.66 \pm .10$ ms) condition.

Hydration measures. Measures of hydration status were compared between the pre- and post-heat stress trial periods. Body mass was significantly decreased ($t_9 = 15.348, P \leq .001$) as a result of the heat stress trial with participants losing an average of 3.27% or 2.56 kg. Urine color was significantly ($t_9 = -6.128, P \leq .001$) increased 26.0% in the dehydrated (mean = 6.34 ± 1.2) compared to the euhydrated (mean = 4.7 ± 1.5) condition. Urine specific gravity was not significantly ($t_9 = -2.039, P = .072$) different between conditions.

Discussion

This experiment was designed to identify the effects of heat stress trial-induced active dehydration on cognitive performance. Based on our limited sample, our results were inconclusive compared to previous investigations (Cian et al., 2000; Gopinathan et al., 1988; Sharma et al., 1986) that reported impaired cognitive performance on paper-and-pencil type tests with various confounding variables. Two previous investigations (Gopinathan et al., 1988; Sharma et al., 1986) concurrently stated that impairment recorded in mental performance was proportional to the degree of dehydration and was significant at 2-3% dehydration. In contrast with past research, our results found there to be both improvements and decrements in the level of cognitive performance functioning with an average dehydration of 3.27%. Previous studies (Gopinathan et al., 1988; Sharma et al., 1986) have examined trained soldiers and manual labor workers, whereas our study examined all ranges of people from the surrounding community not attributed to a nominal group. Trained individuals may have been prepared to perform their duties in a similar matter perhaps accounting for the similarities in test scores. Previous investigations (Gopinathan et al., 1988; Sharma et al., 1986) used traditional pencil and paper cognitive tests to determine level of functioning.

As technology has advanced, so has the means to administer neuropsychological testing. The Headminder™ CSI test is a robust neuropsychological examination tool that is very sensitive to small changes in outcomes. The Headminder™ CSI test was designed to measure cognitive functioning in a neurologically impaired individual or one that is recovering from a concussion. Test administration may occur over a time period of weeks or months. In the current study, participants were administered two tests within a short period of about 3 hours allowing the possibility of improvement as a confounding learning effect. Many participants openly expressed that they better understand the examination during the second administration, making it easier to perform the tasks associated with the test. To confound this limitation in the future, a preliminary practice administration of the Headminder™ CSI test should be performed prior to the prior to testing day.

The Headminder™ CSI test was administered to participants in a dehydrated condition

following an exercise heat stress trial lasting up to 2 hours. Upon completion of the heat stress trial, participants relaxed in a thermoneutral environment for an average of 50.2 ± 17.05 min (range = 28 – 80 min). The recovery period was provided to allow participants' core body temperature to return to baseline and to reduce the effects of exercise fatigue from the heat stress trial. Nonetheless, participants' motivation level ratings were decreased and fatigue severity ratings were significantly increased prior to the second administration of the Headminder™ CSI. Therefore, we must conclude that although participants had ample time to reach baseline core body temperature, cognitive performance on the Headminder™ CSI may have been affected by the mental and physical effects of the heat stress trial.

To an individual or athlete involved in a high risk activity, the constructs of cognitive performance that are important are the ability to process information quickly and then respond accordingly as soon as possible. Participants in our study presented unexpected findings on these measures of processing and response speed. Processing speed revealed an improvement in the dehydrated condition compared to the euhydrated condition. This may be explained by the participants' interest and willingness to complete the second trial of cognitive testing. However, response speed data revealed a decrement from the euhydrated to the dehydrated condition. These findings are clinically important although processing speed may not change or perhaps even improve, if the response to the stimulus cannot be completed normally, the potential for negative outcomes increases.

Physiologically, the basis for decreased cognitive performance may be attributed to a variety of mechanisms, all of which remain largely theoretical. More research is necessary to identify specific physiological mechanism to explain brain function in an exercise heat stress environment. Hocking, Silberstein, Lau, Stough, and Roberts (2001) theorized the existence of a "cognitive reserve," whereby subjects have at their disposal a certain amount of neural resources that can be allocated to the performance of cognitive tasks and activities when resources are diminished. Cognitive performance may deteriorate when the amount of resources necessary to deal with the tasks and the thermal stress is lacking, such that subjects will be able to maintain performance level until the resources are overloaded. We can speculate that participants the current study were able to utilize their cognitive reserve for part or all of the cognitive testing resulting in improvements on several of the subtest scores.

We sought to add to the body of evidence that acute bouts of steady-state exercise and heat induced dehydration affect cognition. Prolonged exercise leading to dehydration and its accompanying metabolic changes are associated with impaired information processing and cognition. Few researchers have attempted to determine the combined effects of exercise and heat stress-induced dehydration on cognitive performance in a well-designed and controlled study. The current knowledge is still at a general level and many questions remain. It is important for athletic trainers, coaches, nutritionists and other medical professionals to understand the how active dehydration and heat stress affect both the physical and psychological performance of the athlete. Much more research is needed to determine the impact of dehydration on cognitive performance.

References

Cian, C., Koulmann, N., Barraud, P. A., Raphel, C., Jimenez, C., & Melin, B. (2000). Influence of variation in body hydration on cognitive function: Effect of hyperhydration, heat stress, and exercise induced dehydration. *Journal of Psychophysiology, 14*, 29-36.

- Cian, C., Barraud, P. A., Melin, B., & Rapel, C. (2001). Effects of fluid ingestion on cognitive function after heat stress or exercise-induced dehydration. *Journal of Psychophysiology*, 42, 243-251.
- Cleary, M. A., Kimura, I. F., Sitler, M. R., & Kendrick, Z. V. (2002). Temporal pattern of the repeated bout effect of eccentric exercise on delayed-onset muscle soreness. *Journal of Athletic Training*, 37, 32-36.
- Headminder Inc. (2002). Headminder™ Cognitive Stability Index professional manual. Available at www.Headminder.com Accessed November 7, 2003.
- Hocking, C., Silberstein, R. B., Lau, W. M., Stough, C., & Roberts, W. (2001). Evaluation of cognitive performance in the heat by functional brain imaging and psychometric testing. *Comparative Biochemistry and Physiology*, 128, 719-734.
- Jimenez, C., Koulmann, N., Mischler, I., Allevard, A-M., Launay, J-C., Savourey, G., & Melin, B. (2002). Plasma compartment filling after exercise or heat exposure. *Medicine and Science in Sports and Exercise*, 34, 1624-1621.
- Gopinathan, P. M., Pichan, G., & Sharma, M. A. (1988). Role of dehydration in heat stress-induced variations in mental performance. *Archives of Environmental Health*, 43, 15-17.
- Sawka, M. N. (1992). Physiological consequences of hypohydration: Exercise performance and thermoregulation. *Medicine and Science in Sports and Exercise*, 24, 657-670.
- Sharma, V. M., Sridharan, K., Pichan, G., & Panwar, M. R. (1986). Influence of heat-stress induced dehydration on mental functions. *Ergonomics*, 29, 791-799.
- Weiskopf, R. B., Kramer, J. H., Viele, M., Neumann, M., Feiner, J. R., Watson, J. J., Hopf, H. W., & Toy, P. (2000). Acute severe isovolemic anemia impairs cognitive function and memory in humans. *Anesthesiology*, 92, 1646-1652.

Table 1
Headminder™ CSI Cognitive Factors and Subtests Response Time Raw Score Means and Standard Deviations

| Cognitive Factor | Condition | Mean ± sd | Subtests | Condition | Mean ± sd |
|------------------------------|---------------|---------------------------------------|---|---------------|---------------|
| Processing Speed* (n = 9) | Euhydration | 3.03 ±.32 | Animal Decoding (response time) | Euhydration | 2.30 ±.35 |
| | | | | Dehydration | 2.41 ±.53 |
| | Dehydration | 2.78 ±.43 | Symbol Scanning* (response time) | Euhydration | 3.76 ±.34 |
| | | | | Dehydration | 3.16 ±.57 |
| Response Speed (n = 10) | Euhydration | 95.60 ±12.00 | Response Direction 1 (response time) | Euhydration | 84.30 ±11.30 |
| | | | | Dehydration | 79.00 ±10.39 |
| | Dehydration | 93.60 ±14.06 | Response Direction 2 (response time) | Euhydration | 93.40 ±12.33 |
| | | | | Dehydration | 97.30 ± 9.52 |
| | Euhydration | 103.8 ±12.81 | Number Recall (number correct) | Euhydration | 101.70 ±10.87 |
| | | | | Dehydration | 97.40 ±16.64 |
| Dehydration | 104.30 ±15.84 | Number Sequencing (number correct) | Euhydration | 99.90 ±12.12 | |
| | | | Dehydration | 98.60 ±15.49 | |
| Attention (n = 10) | Euhydration | 103.8 ±12.81 | Number Recall (number correct) | Euhydration | 100.10 ±14.09 |
| | | | | Dehydration | 99.10 ±16.04 |
| Dehydration | 104.30 ±15.84 | Number Sequencing (number correct) | Euhydration | 105.50 ±10.06 | |
| | | | Dehydration | 107.40 ±16.78 | |

A Model of Culturally-Diverse Patterns of Communication for Meaningful Learning

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Abstract: Teachers who address culturally-diverse classrooms using their own cultural 'communication modes' promote 'communication dysfunctions' which diminish the classrooms' production of meaningful learning. A proposed interaction model of culturally-diverse patterns of communication supplies 'cultural congruency' at all levels of communication between teachers and students. The Model proposes that teachers address the culturally-diverse classrooms in as many diverse communication modes as culturally-diverse are the students. The Model was created as a response to the unsatisfactory Meaningful Learning efficiency of a traditional one-cultured-teacher, teaching to a Multicultural classroom.

Displaced Comminuted Patellar Fracture Associated with Post Anterior Cruciate Ligament Reconstruction in a Male Collegiate Basketball Player

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Abstract: We present a unique case of a collegiate athlete who suffered an anterior cruciate ligament (ACL) injury leading to a displaced patellar stress fracture. We identified an unusual potential association between ACL reconstruction and patellar fractures in order to avoid potential complications in the rehabilitation and return to activity process.

Section Two:
Urban Education Master's Program
Action Research Poster Sessions

Professional Leaders in Urban Schools (PLUS) Project

The Professional Leaders in Urban Schools (PLUS) project is a federal grant in the College of Education, funded through the U.S. Department of Education, Office of English Language Acquisition. It provides tuition scholarships for teachers from the Miami-Dade County Public Schools (M-DCPS) to complete a Master's degree in Urban Education with a specialization in Multicultural/TESOL. The program develops the knowledge, skills and dispositions of educators to work with linguistically and culturally diverse students while offering an opportunity to obtain English for Speakers of Other Languages (ESOL) endorsement. Additionally, the project prepares teachers to seek National Board for Professional Teaching Standards (NBPTS) certification by aligning all of the courses and experiences within the program of studies with National Board standards. The framework for the program of studies emphasizes promoting the role of teachers as researchers and change agents. Teachers collaborate with peers and university mentors in the conceptualization and implementation of action research studies aimed at improving practice and creating change in urban classrooms and schools. Currently, a total of 39 elementary classroom teachers are participating in the project.

FIU's Master of Science in Urban Education is designed to provide specialized knowledge and practice in areas related to urban/multicultural contexts in an effort to enhance the effectiveness of educators working in diverse settings. The program offers three areas of specialization: Multicultural/TESOL, Instruction in Urban Settings, and Learning Technologies. The PLUS project constitutes one of the federal initiatives under this degree program.

Changing Parental Perceptions of Math and Science Curriculum Through Hands-on Workshops

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Purpose of the Study

Many parents hold negative perceptions of math and science because they have never been taught these domains from a hands-on, constructivist approach. Only 20 - 30% of adults have actually experienced activity-based science inquiry. Instead, these individuals were exposed to didactic science programs that emphasize drill, skill and memorization (Shymanksy, 2000). This has had a negative impact upon their content knowledge in these areas and their perceptions of math and science. Consequently, parents are hesitant to incorporate math and science into their home life. There is a dire need to determine if parental perceptions of math, science, and their content knowledge will be positively effected as a result of participation in hands-on science workshops.

Theoretical Framework

Traditionally science has been taught using the top-down model of instruction. This consists of the “passing along” of decontextualized words and sentences from the past. Students are not expected to question or doubt this information, but rather accept it as fact. For most students, this form of instruction leaves gaps in their knowledge and makes understanding difficult if not impossible. Berk explains that learning is an interactive process that is facilitated through the use of manipulatives (Berk, 1999). They can increase student and teacher motivation greatly and are wonderful starting points upon which to build. A hands-on approach is effective in aiding student understanding of scientific concepts, only if the student creates meaning from the experiments or events occurring in the classroom. Programs, such as PALS, engage not only students in hands-on science, but also engage parents by allowing teachers to guide parents as active participants in their children's science education (Shymanksy, 2000). The children take home a science activity bag that is to be completed with their parents. It includes a science lab, materials, instructions, and a correlating piece of literature. Parents who participated in the program reported that discussions of science at home increased, that science labs facilitated their child's understanding of the science content presented at school, and that as a result of the science labs, they became more aware of the science that their child was studying (Shymanksy, 2000).

Method

An action research project was conducted in two urban elementary schools in Miami to address the problem of parental perceptions and content knowledge in math and science. Hands-on science workshops were designed as interventions to this problem. Each workshop addressed a particular science strand and incorporated a data analysis component. Parents and their fifth grade student, who were the target population, are pre-dominantly African American or Haitian American, and the majority of the students are enrolled in free or reduced lunch.

The research design was pre-experimental, one-group pretest-posttest design. It was conducted to evaluate if the independent variable, the science labs, will influence the dependent variable, parental perceptions and content knowledge in science and math. A pre and post attitudinal scale and content exam were the instruments utilized to measure participant gains.

Additionally, home learning was analyzed for completion and accuracy to measure increased parental participation in math and science home learning.

References

Berk, E.G. (1999). *Hands-on science: Using manipulatives in the classroom*. Hatfield, PA.

Shymansky, J.A., Yore, L.D., Dunkhase, J.A., & Hand, B. M. (2000). *Science, parents, activities, and literature: Overview, results and reflections*. Arlington, VA.

Educating Parents on the Accelerated Reading Program

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Purpose of the Study

The Accelerated Reader Program was developed by Paul, VanderZee, Rue and Swanson at the Institute for Academic Excellence. The intention was to provide a computer-based reading program that would be recreational for students and that would provide information to teachers about the students. The majority of the research conducted to date targets the use of the program within the classroom. Results of the program only mention the participation of parents in the program as merely being informed of its existence. Parents are not necessarily included as active players in the daily routines. In fact, it is the lack of research found on the relationship between parent participation and student reading success and reading motivation that fueled the direction of this research. Thus, it created the perfect scenario to investigate the possible connection between parental involvement practices and the success of the Accelerated Reader Program.

Theoretical Framework

Vollands, Topping and Evans (1994) state that a lack of time may be a notable downfall of the Accelerated Reader (AR) program. Therefore, the opportunity to integrate further parent involvement into the AR program provides students with more possibilities for reading time. This component could generate increases in the success rate and reading motivation that the program has set out to accomplish. Johnson and Howard (2003) argue for the importance of recreational reading programs as a means of encouraging the development of a reading habit. Thus, the alignment between parents and schools may produce the reinforcement needed. Hence, it is only fair to say that a home environment conducive to reading and the A.R. program can only foster, not hinder, children's reading habits. Moreover, the research reveals that teachers recognize that parents and family members are the children's first literacy teachers and that they can provide valuable continuing support of their children's literacy development throughout the school years (Sturtevant & Linek, 1999).

Method

This action research study aims at investigating the relationship between student reading success in the Accelerated Reader Program and parental involvement practices. The intervention will target the 3rd grade student population of an elementary school and their parents. The program will be available to all 3rd graders and their parents. An experimental and control group will be employed in the research. A survey will be administered on a pre/post basis to determine children's level of reading motivation. In addition, the students will be pre/post tested with the STAR reading test to determine changes in reading levels. Finally, the on-going monitoring of student progress within the Accelerated Reader Program will measure the success of the relationship between the program and parental involvement. The expectation of this investigation is to support the positive reinforcement created by parent participation in their child's Reading Program and the students' success rate in increasing reading scores and motivation to read.

References

- Johnson, R. A., & Howard, C. A. (2003). The effects of the accelerated reader program on the reading comprehension of pupils in grades three, four and five. *The Reading Matrix, 3*(3).
- Surtevant, G., & Linek, W. M. (1995). Parents and teachers working together toward literacy: Views from the past and goals for the future. *Reading & Writing Quarterly: Overcoming Learning Difficulties, 11*, 233-245.
- Vollands, S. R., Topping, K. J., & Evans, R. M. (1999). Computerized self-assessment of reading comprehension with the Accelerated Reader: Action research. *Reading & Writing Quarterly, 15*, 197-211.

Parental Involvement between Two Different Urban Communities

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Statement of the Problem

Parent involvement is an integral part of a child's educational progress. In some cases, students' academic achievement can be directly related to the level of parental involvement exhibited in schools. Families' perception of roles toward parental involvement in schools may vary among groups from diverse cultures. In today's urban schools, the increasing diversity of cultures may contribute to differences in levels of parental involvement. The purpose of this research is to address the need to promote parental participation in the educational process of their children. This study will focus on three research questions: Are there differences in levels of parental involvement after participating in a program designed to assist them with their children's reading skills? Are there changes in the attitudes of families towards parental involvement after participating in the instructional cycle? Is there a relationship between the level of parental involvement and student academic achievement?

Theoretical Framework

Parental involvement has dramatically changed throughout the past two centuries in the United States. Originally, this involved supporting teachers and the schools' needs by attending meetings, school events, and helping with homework. Currently, the needs of children, teachers, and schools are different. This evolution has led to the question, what is parental involvement in today's urban community? Researchers define parental involvement in a variety of ways. According to Perroncel (1993), parental involvement must combine the home, school, and community together to support a child's educational process. Berger (1995) said, "The primary factor for children's educational success or failure is parent interest and support" (p. 43).

Notwithstanding, parents' and teachers' perceptions concerning parental involvement are often very different. Many parents believe that adequate participation includes the casual classroom visit, attending field trips and/or parent conferences. Oftentimes, both groups may not realize the potential of parental involvement to directly influence a child's academic achievement. Thus, more new interventions are needed aimed at determine how parental participation can be increased among members of various cultural groups in the nation's urban schools.

Method

This action research will be conducted in two urban schools in the Miami-Dade County Public Schools system. School A consists of a predominantly Hispanic student population, whereas school B is predominantly Haitian. The participants of the study are the parents from four elementary classrooms (kindergarten, first, second, and fifth grades). The intervention involves engaging families in a series of six two-hour workshops, each designed to improve children's reading skills, and provide parents with the knowledge and tools needed to reinforce reading instruction at home. The study involves a one-group pre/post test designed to assess changes in parental attitudes and levels of involvement resulting from their participation in the instructional cycles. The reading academic achievement of the participating children will be measured on a pre/post basis in order to determine the impact of the families' involvement.

References

- Berger, E. H. (1995). *Parents as partners in education: Families and schools working together*. Englewood Cliffs, NJ: Prentice Hall.
- Pena, D. (2001). Parental involvement: Influencing factors and implications. *Journal of Educational Research*, 94, 42-53.
- Peronnel, C. (1993). *Parent involvement: An essential element for student success*. Charleston WV: Appalachia Educational Laboratory.
- Weitock, T. (1991). *The development and implementation of a parent outreach program to increase school involvement of fourth grade parents*. Unpublished manuscript, Nova Southeastern University, Ft. Lauderdale, FL.

Grandparents: “The New Parents”

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Statement of the Problem

Over the course of the past decade, the number of grandchildren under the custody of their grandparents is steadily increasing. The majority of these grandparents lack the necessary skills to successfully attend to the academic needs of their grandchildren. The purpose of this action research is to provide viable answers for the following questions: Will grandparents feel more comfortable addressing school related issues after participating in programs geared towards their grandchildren’s academic success? Do programs geared towards their grandchildren’s academic success influence the grandparent’s level of participation in school related issues? As a result of the program, will grandchildren feel more confident seeking and receiving assistance from their grandparents?

Theoretical Framework

According to Fuller-Thomson, Minkler, and Driver, “proportionally, 4.0% of White, 6.5% of Hispanic, and 13.5% of African-American children are living in grandparent-headed homes” (1997, p. 72). Due to this overwhelming number of children being raised by grandparents, programs and strategies must be offered that will help these students be successful in the classroom. As stated by Pruncho and Johnson, “Support groups for grandparent caregivers may help relieve their sense of isolation and provide a forum for support, venting frustrations, and opportunity to compare coping strategies with others in similar situations” (1996, p. 66). Our action research will target this population of grandparents, who carry the sole responsibility of raising their grandchildren. As published in an article by the *U.S. News and World Report*, these grandparents are the “silent warriors” (Creighton, 1991, p. 88).

Method

During this action research study, several methods of data collection will be employed. First, a general survey will be distributed to the entire fifth grade student body, identifying those households that are grandparent-headed. Second, once our target population has been identified, grandparents will be invited to attend six weeks of two-hour workshops and seminars. During the first meeting, the grandparents will answer a family survey and questionnaire, which will provide us with socio-demographic information about these families. Pre and post-tests will be administered to participants in order to determine their general perceptions towards parental involvement and assess their level of participation in school related activities. The topics of the workshops will include FCAT Strategies, Effective Behavior Management Techniques, Tips for Successful Home Learning, and general information about Dade County services. The grandchildren will also be expected to participate in the workshops. Children’s attitudes toward their grandparents’ involvement in schools will be measured on a pre/post basis with a locally developed scale.

References

- Creighton, L. L. (1991). Silent saviors. *U.S. News and World Report*, 26(111), 88-89.
Fuller, B., Thomson, M., & Minkler, S. (1997). Grandparents as parents: A survival guide for raising a second family. *The Gerontologists*, 61, 67-75.

Pruchno, R., & Johnson, K. (1996). Research on grandparenting: Review of current studies and future needs. *Generations, 16*(21), 65-68.

Parents Acquiring Learning Strategies (PALS): How Empowering Hispanic Parents Increases Parental Involvement and Student Achievement

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Purpose of the Study

Some Hispanic parents in Miami-Dade County show limited involvement in the educational process of their children. Currently, Miami-Dade County Public schools consists of an increasingly high number of language minority students who come from homes where parents are limited in their English proficiency. Consequently, these parents have difficulty assisting their children with schoolwork and often feel they lack adequate skills to involve themselves in school curricula. The lack of parental involvement by this population has a negative impact on students' learning and their academic achievement. The purpose of this study is to impact the level of participation of these families and to study its ultimate effect on students' academic achievement.

Theoretical Framework

Research indicates that there is a positive influence on children when parents support and encourage their children's learning (Olsen & Fuller, 2003). Positive correlations have been found between parental involvement and children's achievement test scores, grades, motivation and attitudes, classroom behavior, self esteem, and school attendance (Finn, 1998). Three types of parental involvement at home are consistently associated with aiding student performance at school: (a) actively organizing and monitoring the student's time, (b) discussing school matters with the child, and (c) helping with homework (Finn, 1998).

In a study of the parental involvement of parents learning English as a second language, it was reported that the involvement of Hispanic parents in their children's education is often limited due to lack of time or perceived ability (Cassity & Harris, 2000; Olsen & Fuller, 2003). However, there is positive research to indicate that when parents are made aware of their expected role in this area, they develop interest in knowing more about effective homework helping strategies and tend to get involved despite their personal limitations or difficulties (Hoover-Dempsey & Sandler, 1997). When school group members (parents, teachers, administrators, and children) communicate frequently and have a shared understanding of role expectations, there is success in maintaining parents' involvement (Lim, 2003).

Method

The intervention will consist of eight two-hour sessions at an urban public K-8 Center school in Miami-Dade County, Florida. The demographic composition of this school is Hispanic (69.7%), Black (25%), White (5%), and Others (less than 1%), with 90% of students on free or reduced lunch. The participants are approximately 15 Hispanic parents, 17 students (grades K-7), and 12 teachers. The instruction will involve teaching strategies to promote parental participation in their children's school-related activities.

The design of this action research study involves using mixed methods in order to determine the impact in the level of participation of these families and its ultimate effect on students' academic achievement as measured by increases in (a) home learning completion, (b) class participation, and (c) academic performance in reading, math, or other content areas. To determine if there is any difference in parents' level of school participation after the intervention,

parents and students will complete pre and post questionnaires assessing participation levels. Classroom teachers will complete pre and post questionnaires to assess student behaviors regarding (a) home learning completion, (b) class participation, and (c) academic performance. All parents will complete a demographic questionnaire. To monitor comprehension and use of learning strategies, focus groups will be conducted during and after the interventions.

References

- Cassity, J., & Harris, S. (2000). Parents of ESL students: A study of parental involvement. *NASSP Bulletin* 84(619), 55-62.
- Finn, J. D. (1998). Parental engagement that makes a difference. *Educational Leadership*, 55(8), 20-24.
- Hoover-Dempsey, K.V., & Sandler, H. M. (1997). Why do parents become involved in their children's education? *Review of Educational Research*, 67(1), 3-42.
- Lim, S. (2003). Home-school relations working successfully with parents and families. *Parent Involvement in Education*. Boston: Allen and Bacon.
- Olsen, G., & Fuller, M. L. (2003). *Home-school relations working successfully with parents and families*. Boston: Allen and Bacon.

It Takes a Village to Educate a Child: Guiding Parents on How to Implement FCAT Strategies With Their Children During Home Learning

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Statement of the Problem

The purpose of this study is to examine the effects of parental involvement on students' academic achievement. This research further proposes to investigate the effects that reading comprehension workshops for parents will have on the level of their involvement. Moreover, results from the study will contribute to the establishment of effective structures of family involvement. The following research questions will guide the study: Is there an increase in parents' confidence in their abilities to help their child in school as a result of parent workshops? Will there be a gain in parents' understanding of FCAT strategies through the use of parent workshops? Will there be an improvement in students' test scores because of parental involvement in parent workshops?

Theoretical Framework

The theoretical framework guiding this study is the extensive literature on the involvement of family and its role in students' achievement. Although the literature supports the positive impact of parental involvement, there is a significant need to investigate the reasons for the deficiency of this type of involvement, as well as strategies for its enrichment. Research indicates that when parents are involved with their children's learning, academic performance and home learning efforts improve (Sanders & Epstein as cited in Biggs, 2001). Getting parents involved in a child's education has many benefits, which include greater retention of knowledge and higher FCAT scores. Currently, although the benefits of parental involvement may be abundant, the lack of such involvement is a phenomena that plagues urban schools all over the nation. "In an era of diminishing resources and increasing pressure for improved outcomes for our young people, the strengthening of family-community-school partnerships has become a hot topic" (Heleen, 1992, p. 5). Although much has been written with regard to the positive effect of family involvement in learning, there are several causes for the lack of it. Many parents are uneducated with regard to their role in education. They simply don't know what is expected of them or what is appropriate. For example, African American parents may believe that although they should monitor their child's education, they should not necessarily intervene (Hill & Craft, 2003). According to a survey of 42 urban schools that focused on parental involvement programs, the schools that had the most success with parent meetings had created programs that required in-depth participation from the parents (Heleen, 1992). Parental workshops are a great way of bringing families and schools together. Smalley and Reyes-Blanes (2001) found that when schools and parents work together toward the common goal of educating their children, "students move closer to, if not exceed, substantive educational goals" (p. 531).

Method

This study involved parents of second, fourth, and fifth grade students in an urban elementary school. The Title I school has a student composition of over 70% African-American. The investigation utilized a one group pretest and posttest design measuring changes in parental involvement behaviors and its impact on the students' test scores. The instruments included a demographic questionnaire used to gather data pertaining to gender, income level, employment status, and number of children. Surveys were administered on a pre/post basis in order to

determine changes in parental perceptions regarding their efficacy in contributing to their childrens' education as well their knowledge of strategies associated with test taking and reading comprehension. Changes in students' reading achievement were measured on a pre/post basis with locally developed instruments.

References

- Biggs, S. C. (2001, May). Writing workshops: Linking schools and families. *English Journal*, 45-51.
- Heleen, O. (1992, November). Is your school family-friendly? There are a number of ways to effectively link schools with families and communities. *Principal*, 5-8.
- Hill, N. E., & Craft, S.A. (2000). Parent-school involvement and school performance: Mediated pathways among socioeconomically comparable African American and Euro-American families. *Journal of Educational Psychology*, 95, 74-83.
- Smalley, S.Y., & Reyes-Blanes, M. E. (2001). Reaching out to African American parents in an urban community: A community-university partnership. *Urban Education*, 36, 518-533.

Parents' Comfort Level: Does it Reflect in the Help They Provide Their Children During Home Learning?

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Statement of the Problem

In recent years the literature on parental involvement and how it affects children during home learning has emphasized the relevance of promoting student achievement through parental involvement. Research points to a strong connection on the positive effects for families, children, and school when schools extend themselves to parents and involve them to support their children's development and learning (Olsen & Fuller, 2003) Consequently, the purpose of this research is to attempt to investigate if parents' comfort level with reading reflects the help that they provide their children at home with their home learning. Our goal is to increase parents' level of efficacy in relation to helping their children with home learning as it relates to the reading benchmarks.

Theoretical Framework

There is growing evidence connecting parental involvement with students' academic achievement (Kelley, 2003). Parents are their children's first teachers and play an important role in shaping their children's attitude about education (Kelley, 2003). According to Becher (1986), parents who are involved in child care and educational programs develop positive attitudes about themselves, increase their self-confidence, and often enroll in programs to enhance their personal development. A nurturing school culture helps establish a positive relationship with parents who may feel uncomfortable and intimidated in the school setting (Kelley, 2003). Many parents need training and support in academic skills in order to help their children at home. There are many ways to awaken and tap the special abilities and concerns that parents have regarding their children's education (Peterson, 1989). In addition to promoting families to attend teacher-parent conferences, P.T.A. meetings, and open houses, which are relevant, teachers and schools should reach out to parents in other ways. The home environment, more familiar and less structured than the classroom, offers what Rich (1985) calls "teachable moments that teachers can only dream about" (p. 93). Yet, as Ascher (1987) points out, certain family characteristics often contribute to academic achievement of students. These include households in which the parent or parents do not often interact with their children, households where the composition frequently changes, non-English speaking households, and families whose cultural traditions sharply vary from the schools.

Method

This action research project involves two schools from the Miami-Dade County Public Schools (M-DCPS) system, in Miami, Florida. In school A, over 75 % of the student population enter the school as new immigrants to the United States. Approximately 98 % of the students are non- English speakers. The school currently serves pre-kindergarten through fifth grade students with an enrollment of 805 students. School B is located in a predominately low socioeconomic area. Over 98% of the student population is African-American. The school currently serves pre-kindergarten through fifth grade students with an enrollment of 240 students.

The intervention will involve offering workshops to families on how to assist their children in their home learning. The classrooms that will be involved in this action research project are a kindergarten, third and fourth grade classes at the aforementioned schools. The

research utilizes a pre-experimental one-group pretest-posttest design. Participants will be observed on a pre/post basis in order to determine changes in their comfort levels toward assisting their children in home learning and measuring levels of involvement.

References

- American Association of School Administrators. (1988). *Challenges for school leaders*. Arlington, VI: Author.
- Ascher, C. (1987). *Improving the school-home connection for poor and minority urban students*. New York: (ERIC Document Reproduction Service No. ED300484).
- Becher, R. (1986). *Parents and schools*. Illinois: Elementary and Early Childhood Education. Urbana, IL. (ERIC Document Reproduction Service No. ED269137).
- Cahill, M. (1996). *Schools and community partnerships: Reforming schools, revitalizing communities*. Chicago: Cross City Campaign for Urban School Reform.
- Kelley, G. J. (2003). Bridging the achievement gap. *Urban Education*, 1(2), 6-13.
- Olsen, G., & Fuller, M. L. (2003). *Home-school relations working successfully with parents and families*. Boston: Allen and Bacon.
- Peterson, D. (1989). *Parent involvement in the educational process*. Oregon. (ERIC Document Reproduction Service No. EA 43).
- Rich, D. (1985). *The forgotten factor in school success: The family: A policymaker's guide*. District of Columbia: The Home and School Institute.

The Effect of Parent Volunteers on Reading Scores and Attitudes

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Statement of the Problem

The purpose of this study is to investigate the relationship between student reading achievement and family involvement in urban schools. In this action research project, family members will be invited to participate as reading mentors during class time. In this study, the mentors will have the chance to impact the students by reading aloud to them in small groups. It is hypothesized that this will increase the student's reading scores and motivate students to read for enjoyment.

Theoretical Framework

The literature indicates that "lifelong enjoyment of reading is directly related to daily reading" (Wang, 2000, p. 122). Additionally, there is evidence demonstrating that time spent in recreational reading can be a predictor of academic success for children (Gallic, 1999). Over the last two decades, studies have documented the positive impact that parent involvement has on test scores and student achievement (Cooper, Lindsay, & Nye, 2000). Research has also indicated significant gains in children who were continuously exposed to a rich literacy environment and their emergent literary knowledge (Kwon, 2003). According to Drake (2000), reading mentors can significantly benefit elementary school students. A significant number of urban schools claim a lack of parental involvement (Pollard-Durondola, 2003). Henderson (1987) has stated that parental involvement sends a positive message to children about the importance of their education. Parents can be invaluable partners not only in their children's education, but to the overall functioning of schools. Thus, the more schools pursue a partnership with families, the more successful that they will be in accomplishing educational goals.

Method

This action research study features a quasi-experimental design comparing results between the experimental and control group following an intervention. Families in the experimental group will be asked via telephone and in person to volunteer to read to the students in class. The mentors will be scheduled to read twice per week for thirty minutes over a twelve week period. To measure the students' growth, the Diagnostic Reading Assessment and Reading Attitude Survey will be administered on a pre and post-test basis. Comparisons in reading achievement will be made between the students in the experimental and control groups. The aim of this study is to emphasize the importance of family involvement and at the same time to show how this can contribute to an increase in students' reading levels. In addition, the investigation will examine the impact of the intervention on increasing students' enjoyment for reading.

References

- Cooper, Lindsay, & Nye. (2000). Barriers in Parent Involvement in Middle School Health Education. *American Journal of Health Studies*, 16-24.
- Drake, D. (2000). *Parents and families as partners in the education process*. Baltimore, MD.
- Gallic, D. (1999). Do they read for pleasure? *Journal of Adolescence and Adult Literacy*, 482-488.

- Henderson, A. (1987). *The evidence continues to grow: Parent involvement improves student achievement-an annotated bibliography*. Columbia, MD: National Committee for Citizens in Education.
- Jacob, B. (2004). The impact of teacher training on student achievement. *Journal of Human Resources, 50-79*.
- Kwon, H. (2003). The difference in attitudes toward emergent literacy of children. *Reading Improvement Journal*.
- Pollard-Durondola, S. (2003). Wesley Elementary: A beacon of hope for at-risk students. *Education and Urban Society, 94-117*.

How Can Teachers Alleviate Parental Anxiety in High Stakes Testing?

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Statement of the Problem

In Florida, third and tenth graders are required to take the Florida Comprehensive Assessment Test (FCAT), a high stakes test. Third graders must score a Level 2 or higher on the Sunshine States Standards portion of the FCAT or fifty-one percent or higher on the Norm-reference portion of the FCAT in order to be promoted. In 2003, the Florida Department of Education reported 31 percent of third graders in Miami-Dade County were retained (2003).

The purpose of the study is to investigate how third grade teachers can decrease the level of parental anxiety for this high stakes test and determine if there are different levels of parental anxiety based upon certain variables. Parent workshops will be offered to families focusing on FCAT strategies and relaxation techniques designed to increase parental efficacy and decrease parental anxiety related to high stakes testing.

Theoretical Framework

In order to end social promotion, students need to demonstrate more than a minimal amount of reading and math ability (Amrein & Berliner, 2002; Horn, 2003). Incentives are given to those who achieve mastery and penalties for those who fail (Amrein & Berliner, 2002). Tracking, promotion, and graduation are the consequences (Amrein & Berliner, 2002; Klein, Hamilton, McCaffrey, & Stecher, 2000). There are disproportionate numbers of minorities and low socioeconomic students who have not demonstrated acceptable levels of mastery on these tests (Amrein & Berliner, 2002; Horn, 2003).

Test anxiety is the uneasiness or apprehension that a student experiences before, during, or after a test because of worry or fear of failure (Vrana, 1999). It may cause children to rush through testing in order to escape the unpleasant physical experiences, and can create an “invisible disability” of achievement stress that can extend throughout a student’s academic career. As pressure is placed on students to achieve higher test scores, there is a need to implement interventions to help reduce test anxiety (Cheek, Bradley, Reynolds, & Coy, 2002).

This demand for high stakes testing is putting more pressure on students, teachers, and parents (Guleck, 2003). For parents, their child’s anxiety triggers helplessness and anxiety (Mulvenon, 2003). Parents can help balance the importance of preparation against the reality of a particular exam (Vrana, 1999). Longitudinal studies indicate that students whose parents are involved in their academics will experience higher achievement scores (Sheldon, 2002).

Method

This study takes place at three different elementary schools in Miami-Dade County, Florida. The student composition ranged from predominantly Hispanic to African-American, with a large concentration of students participating in the free and reduced lunch program. The subjects of the study are parents of current third grade students who will take the FCAT in March 2004.

Transcripts from focus groups of third grade teachers will be analyzed to determine common themes related to ways to decrease parental anxiety. Parents will be administered a pre- and post parent efficacy scale designed to measure changes in parental anxiety after participating in the parent workshops. Results of pre and post surveys will be compared among the different schools.

References

- Amrein, A. L., & Berliner, D. C. (2002). High-stakes testing, uncertainty, and student learning [Electronic version]. *Educational Policy Analysis Archives*, 10(18), 340-409. Retrieved November 17, 2003 from <http://eppa.asu.edu/epaa/v10n18/>.
- Cheek, J. R., Bradley, L. J., Reynolds, J., & Coy, D. (2002). An intervention for helping elementary students reduce test anxiety. *Professional School Counseling*, 6(2), 162-164.
- Florida Department of Education (2003). *Florida Comprehensive Assessment Test (FCAT) 2003. State Report of District Results* [Data file]. Available from Florida Department of Education Web site: <http://www.firn.edu/doe/sas/fcat/fcpress.htm>.
- Guleck, C. (2003). Preparing for high-stakes testing. *Theory Into Practice*, 42(1), 42-51.
- Horn, C. (2003). High-stakes testing and students: Stopping or perpetuating a cycle of failure? *Theory Into Practice*, 42(1), 30-41.
- Klein, S. P., Hamilton, L. S., McCaffrey, D. F., & Stecher, B. M. (2000). What do test scores in Texas tell us? [Electronic version] *Education Policy Analysis Archives*, 8(49), 961-982. Retrieved November 24, 2003 from <http://epaa.asu.edu/epaa/v8n49/>.
- Sheldon, S. B. (2002, March). Parents' social networks and beliefs as predictors of parent involvement, *The Elementary School Journal*, 102(4), 301-316.
- Vrana, S. (1999, May). *Support from mom and dad lessens test anxiety*. West Lafayette, IN: University of Purdue Press. Retrieved November 5, 2003 from <http://www.purdue.edu/UNS/html4ever/9904.Vrana.test.html>

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Appendices

*Call for Papers 2005 for the Fourth Annual College of Education Research Conference at Florida International University
Saturday April 23, 2005*

The cornerstones of the College of Education: Interculturalism, Interconnectedness, Inquiry, Instructional Leadership

Conference Mission: The purpose of the Florida International University Annual College of Education Research Conference (COERC) is to enhance the existing research culture. The conference provides a meaningful vehicle for the preparation, mentorship, and presentation of scholarly work by students, faculty, and alumni.

Interculturalism, Interconnectedness, Inquiry, Instructional Leadership: Decades of educational research indicate that the practice of educating our nation's citizens cannot be judged from a single vantage point. Individuals come to the educational enterprise with different needs and goals often addressed through educational research that weaves a tapestry between practice and theory. We recognize the diverse applications of educational research and the behavioral, psychological, and cultural viewpoints that exist at local, national, and international levels. Conference participants are encouraged to consider the richness of the diverse content areas in education (school and non school based) serving children and adult students.

The Lorraine R. Gay Award for Outstanding Research: To identify and honor the College's emerging scholars, presenters of outstanding research will be awarded with the Lorraine R. Gay Award for Outstanding Research. This award honors the memory of the founding member of the COE research faculty, Lorraine R. Gay. The award will be presented in two categories: (a) best paper authored by an individual student or group of students and (b) best paper co-authored by student(s) and faculty representing a mentoring relationship.

Submission Information: All current and former FIU College of Education students and faculty are encouraged to submit papers. Papers are welcome from practitioners,

students, and faculty from other institutions, Universities, Centers, Institutes, and schools.

All papers must be submitted by **Monday December 13, 2004** for review by the Review and Selection Committee. A double blind review process, ensuring anonymity for both authors and reviewers, will be used for all paper submissions. Once accepted, authors may be asked to revise and resubmit the paper according to suggestions from the Review and Selection Committee and the Conference Proceedings Editor(s). The 6-page single spaced paper will be a complete description of the scholarly work with specific or in-depth analyses of the topic. Papers may be submitted by single or multiple authors. Students are encouraged to submit papers based on theses/dissertations or other scholarly work. Faculty and students are encouraged to submit work performed independently or in collaboration with colleagues.

Paper Presentation Sessions: One to three papers may be presented during the 60-minute sessions organized around common themes. Each session will be in a separate room with up to four concurrent sessions scheduled. The presenter of each paper will be allotted 10 to 15 minutes to present the key points from the paper. The moderator will organize the discussion that follows according to the number of papers in the session and audience interests. MS PowerPoint, overheads, or handouts are encouraged but not required.

The Review, Selection, and Publication Process: The Review and Selection Committee will screen papers for adherence to Submission Instructions and American Psychological Association (APA) 5th (ed) guidelines. Papers that have not followed these basic instructions will be returned to author(s) for corrections and possible re-submission within two weeks of

receipt. All submissions will undergo a double blind review by the Review and Selection Committee, who will review each paper for content, clarity, and organization. Papers may be accepted, accepted with revisions, or rejected. Papers requiring revisions will be returned to the author(s) to either make revisions or address the reason the revision was not made in a cover letter within two weeks of receipt. The proceedings editors will edit every paper, returning them to authors to address the suggested revisions. The edited papers will then be returned to the editors for inclusion in the proceedings. The Proceedings Editor(s) may make necessary formatting and editing changes and contact author(s) for final approval of the paper for publication.

Writer's Workshop Series and Research Resources: Attendance at the workshop series is highly recommended for students planning to submit to the conference. The goal of the workshop series is to contribute to students' success in submission and to increase the quality of the papers to be presented. The workshops are designed to improve writing skills, facilitate the writing process, provide information about the paper formats and requirements, and answer students' questions and concerns. **Participation in a final proposal submission workshop is strongly encouraged for students planning on submitting to and presenting at the Conference.** More information is available at www.fiu.edu/~clearym click on "COE Fourth Annual Research Conference". Sessions are currently facilitated by Dr. Michelle Cleary. All COE students and faculty are welcome to join the Writing Group. Meetings are Sunday evenings from 6 to 8 pm monthly providing feedback on scholarly work in progress to members. For information on contact Dr. Tonette Rocco roccot@fiu.edu, the group facilitator.

**Fourth Annual College of Education Research Conference Saturday April 23, 2005
Call for Papers 2005**

Conference Timeline: Monday December 13, 2003 Midnight Paper Due to COERC Steering Committee

Authors will prepare manuscripts following COERC Submission Instructions and Email their submissions with a cover page, original manuscript, and a blind copy (that which does not indicate any information concerning the author's name or institution) via e-mail to the COERC Steering Committee Chair, Dr. Tonette Rocco at: roccot@fiu.edu. Upon receipt of the paper the Committee will send an e-mail acknowledgement.

Conference Submission Instructions:

Specifically, the title of the subject line of the e-mail message should be: "COE Conference 2005". The e-mail attachments must be formatted as MS Word documents. The cover page should include the author's mailing address, city, state, zip code, work phone, fax, and e-mail address (see Sample Cover Page in the Call for Papers). No hard copy papers or faxes will be accepted.

Please title the (3) email file attachments as follows:

1. Cover Page - Include your last name and the word "Cover" (e.g., *Jones.Cover.doc*).

*Include all author(s) identification/contact information and institutional affiliation (COE Department) on the Cover Page. The manuscript should not contain any identifying information as the Cover Page will be removed to facilitate the blind review process.

*Identify the Paper Category (see Paper Categories list and guidelines)

*Include three (3) Key Words not in the Title that characterize the focus of the paper

*Provide the Warrant Statement.

2. Original Manuscript - Include your last name and the word "Manuscript" (e.g., *Jones.Manuscript.doc*).

*Provide an abstract of 25-50 words.

*The manuscript should be six (6) single spaced pages including references with one inch margins on all sides.

*APA 5th edition guidelines must be adhered to for format, organization, headings, reference citations, grammar, and other issues.

3. Blind Copy - Include your last name and the word "Blind" (e.g., *Jones.Blind.doc*).

Research with Human Subjects: Please be mindful that the FIU Division of Sponsored Research requires completion of the *National Institutes of Health Human Subjects Online Training Module* (<http://cme.nci.nih.gov>) and *Institutional Review Board (IRB)* approval before the collection of any data involving human subjects. For further information contact one of the COE IRB representatives: Dr. Barry Greenberg at greenb@fiu.edu or 305.348.3232 or Dr. Leonard Bliss at blissl@fiu.edu or 305.348.1903.

Thursday January 13, 2005 Notification of Submission Status will be sent to all authors. Suggestions for revisions will be sent with notification of acceptance.

Monday February 14, 2005 Receipt of the Papers with Suggested Revisions

Authors must re-submit the revised 6-page single spaced paper. If additional revisions are needed or APA 5th edition guidelines are not followed the paper will be returned to the author(s) with a date for return.

Monday March 21, 2005 Deadline for Final Revisions of Papers

Please assist us in our efforts to produce high quality proceedings by following instructions, addressing editors/reviewers suggestions for improvement, meeting deadlines, and adhering to APA 5th edition guidelines.

Saturday April 23, 2005 9 a. m. to 5 p. m. Fourth Annual COE Research Conference

Sample Cover Page

| Brief Paper Title | 1 |
|---|---|
| SAMPLE COVER PAGE | |
| Title typed double space in Uppercase and Lowercase Letters and Centered between the Right and Left Margins | |
| First author's name Author's Email and Phone number College of Education, Department of XXXXX | |
| (List in order of contribution) Second author's name, Third author's name, etc. | |
| "I (we) warrant that if this paper is accepted, I (we) will address all concerns of the COERC Reviewers and Proceedings Editors and submit a final (revised) MS Word six page (single-spaced typed) paper for publication in the Conference Proceedings. I (we) understand that if this final paper is not received in its final form on or before March 21, 2005 , this paper will not be included as part of the Proceedings." | |
| Author Preparing Warrant Statement: | |
| <i>Paper Category:</i> Practitioner Concern <input type="checkbox"/> Reports on Research <input type="checkbox"/> Evaluation Studies <input type="checkbox"/> Methods and Issues in Research <input type="checkbox"/> | |
| <i>Key Words:</i> (List three words not in the Title that characterize the focus of the Paper) | |

For questions on submission instructions contact Dr. Tonette S. Rocco roccot@fiu.edu or 305.348.6151 or any member of the Fourth Annual COE Research Committee.

**Fourth Annual College of Education Research Conference Saturday April 23, 2005
Call for Papers 2005**

Note: All moderators, presenters, and their family and friends are expected to register for the COE Research Conference.

Paper Categories

Reports on Research: Reports on research (qualitative, quantitative, or mixed methods studies) including thesis and dissertations with their implications for practice and research.

Methods and Issues in Research: Controversial and critical questions vital to research and practice, such as in research methods, ethics, the use of research in practice, practice-generated needs for research, and processes by which researchers determine the areas in which to conduct research. A description of the issue or summary of the points at issue should be presented.

Practitioner Concerns: Questions and concerns regarding practitioners' work in various settings. This may include, but is not limited to practice in education and training programs in schools, corporate and community organizations, leisure activities for children and adults, or other extra-curricular activities. Papers may address problems and/or solutions in areas of practice such as curriculum design, strategy selection, teaching and learning, or program implementation. They may also address how practitioners view research related to their concerns.

Evaluation Studies or Action Research: Reports on studies involving needs assessment, priority setting, goal analysis, evaluation or other forms of applied research.

Suggested Areas to Address in Papers:

- Theoretical framework/review of the literature that sheds light on the practitioner concern, research question, evaluation purpose, or research issue.
- Clear statement of the research concern/question/purpose/issue to be addressed.
- Research design
 - Rationale for method (qualitative/quantitative/mixed)
 - Research question(s)/Hypothesis
 - Data collection and analysis
- Results of the study and reflections for potential changes in practice/policy/research
- Relationship of findings to existing theory
- Implications and recommendations for a specific field in education (school or non school based)

Paper Submission Checklist

Electronic files

- Cover page, original manuscript, blind copy labeled correctly (e.g. author.cover.doc)
- MS Word is used
- Margins are 1 inch on all sides
- Length of text (including references, tables and figures) is six single spaced pages
- Times New Roman 12pt type font used
- Pages are numbered in the header of the upper right hand corner of each page
- Spelling and Grammar are checked
- Submission Instructions are followed

Cover Page

- Paper Title is provided
- All authors' names, First author's email, phone number, and affiliation
- Paper Category (from Paper Category List)

- Three Key Words not in Title characterizing the focus of the Paper
- Warrant Statement

Original Manuscript

- Paper Title is included
- APA (5th ed.) Guidelines followed throughout
- A theoretical framework for the project is provided
- A clear research question or purpose is stated
- Clearly written using concise language and few pronouns
- Headings are meaningful and provide clear guide to organization
- The scholarly work is relevant to the COE audience
- Method description provides details on what, how, and why for all elements in the research design description
- Paper Category is evident in the presentation
- APA format is followed for references cited in text and listed in Reference List
- All references listed appear as citations
- Tables and Figures provided on separate pages inserted after reference list -----□

Blind Copy

- No author identification is present (Otherwise same as Original manuscript)

Interculturalism, Interconnectedness, Inquiry, Instructional Leadership
Third Annual College of Education Research Conference
April 24, 2004

| Time | Event | Location |
|------------------|---|--------------------|
| 8:00-8:30 a.m. | Registration/ Light Refreshments | LC Foyer |
| 8:30-8:45 a.m. | <i>Welcome</i> Tonette S. Rocco, Co-Chair Conference Steering Committee | LC 110 |
| 8:45-9:15 a.m. | <i>Introduction</i> Anthony Normore <i>Opening Keynote: Dr. George E. Dambach</i> Vice President for Research, Florida International University | LC 110 |
| 9:15-9:30 a.m. | Break | |
| 9:30-10:30 a.m. | <i>Concurrent Sessions 1 & 2</i> | |
| Session 1 | Disability: Leadership And Policy Issues Moderator: Elizabeth Cramer | LC 309 |
| | <i>Universal Design and Differentiated Instruction: Resolving Competing Mandates from IDEA and NCLB</i> Ann Nevin, Carol Ann Falkenberg, Susan Nullman, Liliana Salazar, & Monica C. Silió <i>Technology Integration and School Leadership</i> Michael J. Perez & Anthony H. Normore | |
| Session 2 | Human Development and Student Learning Moderator: Bryan J. Moseley | LC 301 |
| | <i>The Effect of Active Student Responding in Computer-Assisted Instruction on Social-Studies Learning by Students with Learning Disabilities</i> Annamaria Jerome & Patricia Barbetta <i>Derived Relational Responding Performance on Sub-tests of the WAIS-III and the Ability to Derived Relations</i> Martha Pelaez, Denis Hora, Dermot Barnes-Holmes, Maynooth Luzmary Amesty & Karen K. Robinson <i>Metaphor: The Hidden Link between Visual Literacy and Learning</i> Hilary Landorf, Amy Lora & Luis Pagan | |
| Poster Display | College of Education Poster Display Time 1 Posters listed on 3rd page. | LC 114, 116, & 118 |
| 10:30-10:45 a.m. | Break | |
| 10:45-11:45 a.m. | <i>Concurrent Sessions 3 & 4</i> | |
| Session 3 | Issues and Trends In Sports Medicine Moderator: Laura Blitzer | LC 301 |
| | <i>Intrusive Community Noise Negatively Impacts South Florida Residents</i> Adrian Simo & Michelle A. Cleary <i>Effects of a Cooling Vest on Core and Skin Temperature Following a Heat Stress Trial in Healthy Males</i> Rebecca Lopez, Michelle A. Cleary, Ron Zuri & Leon Jones <i>Female Collegiate Volleyball Player with Celiac Disease</i> Lindsey Eberman, Michelle A. Cleary, Ron E. Zuri, & Gary Salvador | |
| Session 4 | Ethics, Efficacy and Collaboration Moderator: Jo Gallagher | LC 309 |
| | <i>Professional Ethics and Welfare Reform: The Importance of Ethical Competence</i> Silvana Ianinska <i>School Efficacy and Educational Leadership. How Principals Help Schools Get Smarter</i> Larry J. Moss | |
| Poster Display | College of Education Poster Display Time 2 Posters listed on 3rd page. | LC 114, 116, & 118 |

| | | |
|----------------|--|--|
| 11:45-1:00 pm | <i>Luncheon and Panel Discussion</i> | LC 110 |
| 12:15-1:00 | Ethical Issues In Conducting Urban and International Research Panel Moderator: Judy Slater Panelists: Joan Wynne, Barry Greenberg, Greg Salters, Lynn Ilon, and Robert Meyers | |
| 1:00-1:10 | Break/Posters are located near the break refreshments. Please stop, read them, and engage the authors. | |
| 1:10-2:10 | <i>Concurrent Sessions 5 & 6</i> | |
| Session 5 | Culture, Identity, and Education Moderator: Lynn Ilon | LC 309 |
| | <i>Detention Home Teens As Tutors: A Cooperative Cross-Age Tutoring Pilot Project</i> David B. Lazerson <i>The Effects of Cultural Distance on Student Socialization and Departure Decisions</i> Kandell Malocsay <i>Human Resource Development Practices in U.S. Enterprises in Russia: A Literature Review</i> Maria Plakhotnik | |
| Session 6 | Enhancing Learning: Class Size and Instruction Moderator: Greg Dubrow | LC 301 |
| | <i>Class Size Reduction for the State of Florida: Is This the Solution for a Better Education?</i> Maria L. Mayo & Anthony H. Normore <i>Class Size Reduction: A Significant Option for Improving Student Learning</i> Deborah A. Finley & Anthony H. Normore <i>The Impact of Quality Teachers on Student Achievement</i> Donna Fong-Yee & Anthony H. Normore | |
| Poster Display | College of Education Poster Display Time 3 Posters listed on 3rd page. | LC 114, 116, & 118 |
| 2:10-2:20 | Break/Posters are located near the break refreshments. Please stop, read them, and engage the authors. | |
| 2:20-3:20 | <i>Concurrent Sessions 7 & 8</i> | |
| Session 7 | Professional Development: Mentoring And Reflection Moderator: Bruce Nissen | LC 309 |
| | <i>When One Dimensional Models Fail: Complexifying Models Of Knowledge Construction</i> Suzanne J. Gallagher <i>A Model for Teacher Induction and Mentoring Programs</i> Kenneth Loughry & Anthony H. Normore <i>Critical Reflection on a Faculty Development Research Project</i> Steve Ratcliff & Tonette Rocco | |
| Session 8 | Research In Hydration Moderator: Dan Dustin | LC 301 |
| | <i>Upper and Lower Body Anaerobic Muscular Power is Adversely Affected by Active Dehydration</i> Leon C. Jones, Michelle A. Cleary, Ron E. Zuri & Rebecca M. Lopez <i>Hyponatremia in Endurance Athletes</i> Stephanie M. Line & Michelle A. Cleary <i>Voluntary, Chronic Dehydration in Adolescent American Football Players</i> Israel D. Mitchell, Michelle A. Cleary, & Stephanie M. Line <i>Cognitive Performance May be Impaired by Exercise in a Hot, Humid Environment: A Preliminary Investigation</i> Ron E. Zuri, Michelle A. Cleary, Rebecca Lopez, Leon Jones, & Bryan Moseley | |
| 3:20-3:30 | Break/Transition | Please stay for the award announcements and door prizes. |
| 3:30-4:45 | <i>Closing Ceremonies LC 110</i> | |
| 3:30-4:00 | Lorraine R. Gay Award for Excellence in Research/Scholarship Presented by Jo Gallagher Award Recipients Honored: Best Graduate Student Paper | |
| 4:00-4:45 | <i>Introduction and Closing</i> Michelle A. Cleary , Co-Chair Conference Steering Committee Appreciating Scholarship: Next Steps: Linda Blanton , Dean College of Education | |

Authors will attend to their posters during their display time. Authors will be free to attend sessions at other times. (Posters will be set up and on display at 8 am while attendees will be free to view them during breaks, authors are only required to be present to discuss the poster during a specific time, which is listed below.)

| | | |
|---|---|---------------|
| Display Time 1 9:30-10:30 a.m. | College of Education Poster Sessions | LC 114 |
| <p><i>Displaced Comminuted Patellar Fracture Associated with Post Anterior Cruciate Ligament Reconstruction in a Male Collegiate Basketball Player</i> J. Martinez, Michelle A. Cleary and G. Garcia</p> <p><i>A Model of Culturally-Diverse Patterns of Communication for Meaningful Learning</i> Jesus D. Escobar</p> | | |
| <p>Professional Leaders in Urban Schools</p> <p>These poster sessions constitute the action research projects, currently in progress, conducted by teachers completing a Master's degree in Urban Education participating in the Professional Leaders in Urban Schools (PLUS) Project.</p> | | |
| Display Time 2 10:45-11:45 a.m. | Urban Education Master's Program Action Research Poster Sessions | LC 116 |
| <p><i>Changing Parental Perceptions of Math and Science Curriculum Through Hands-on Workshops</i> Caridad Aday, Julietta Barreto, and Karie Feldner</p> <p><i>Educating Parents on the Accelerated Reading Program</i> Sandy Araujo-Cox</p> <p><i>Parental Involvement between Two Different Urban Communities</i> Elaine Clemente, Maria C. Gomez, Anais Ospina, Beatriz Rodriguez, and Marlene Sarria</p> <p><i>Grandparents: "The New Parents"</i> Shaketa Gillard, Rockefeller Edouard, and Aurora Garmendia</p> | | |
| Display Time 3 1:10-2:10 p.m. | Urban Education Master's Program Action Research Poster Sessions | LC 118 |
| <p><i>Parents Acquiring Learning Strategies (PALS): How Empowering Hispanic Parents Increases Parental Involvement and Student Achievement</i> Cristina Gonzalez, Maria Cristina Hutchins, Carrie Hernandez, Marlene Llama, Marlene Rossie, and Saybel Suarez</p> <p><i>It Takes a Village to Educate a Child: Guiding Parents on How to Implement FCAT Strategies With Their Children During Home Learning</i> Adriana Linares, Elizabeth Lopetegui, April Bell, and Wendy Rahaman</p> <p><i>Parents' Comfort Level: Does it Reflect in the Help They Provide Their Children During Home Learning?</i> Marisol Rosado, Jonathan Bogos, Lisa Bell, Aracelis Vasquez, and Susana Dominguez</p> <p><i>The Effect of Parent Volunteers on Reading Scores and Attitudes</i> Alicia Utermark, Pamela Knowles, Lisa Rabathaly, Alexandra Chace</p> <p><i>How Can Teachers Alleviate Parental Anxiety in High Stakes Testing?</i> LaTonja Walker, Jorine Voight, and Sonya Jenkins</p> | | |