An Examination of Children's Levels of Inquiry in an Informal Science Setting Beth Clark-Thomas, Malone College

Malone College Chicago and Pine Ridge Mural Projects: Examples of One Community's Negotiated Pedagogical Iconography Designed to Understand the Semiotics of Another Community's Narrative Barbara Moran Drennan, Malone College

Building Collaborational Thinking Skills in a Web Environment: An Instructional Designer's Perspective

Stephen Dundis & Diana Ehrlich, Northeastern Illinois University

#### **Teachers Reflection on Global Learning Strategies Across Content Areas** Ana Gil & Virginia Lebar, Northeastern Illinois University

Adult Learners in 2001

Gary Hoban, National University & Beverly Neu, University of Southern California

#### Maintaining The Traditional Classroom Using On-Line Resources

Kuber Maharjan, Purdue University & Joanne DeFalla, Miami-Dade Comm'y Coll.

# The "American Net" Of Follow-Through and Communities for Effectively Teaching foreign Languages

Daniele Rodamar, American University

# Bridges to Lifelong Learning: The "We" in the Ivory Tower

Connie Ruzich, Robert Morris College

#### The Science Behind Hi-Tek Learning

Victor Selman, The American University & Jerry Selman ERA, Inc.

#### **OPALs Holders of the Mirror: Illuminating the Path to Lifelong Learning** Doris Skelton & Kathy Keller, Southeast Missouri State University

**Technology for Lifelong and Effective Learning for School Counselors** Carolyn Stone, University of North Florida

**The Continental Shift in Education: Global Learning from Asia to Africa** Bruce Swaffield, Malone College

#### Learning by Doing: the Power of the 'Hands On' Approach Don Westwood, Carleton University School of Architecture

# How Children Inquire: Insights for Science Educators

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# ABSTRACT

Elementary school students' understanding of both science content and processes are enhanced by the higher level thinking associated with inquirybased science investigations. Informal science setting personnel, elementary school teachers, and curriculum specialists charged with designing inquiry-based investigations would be well served by an understanding of the varying influence of certain present factors upon the students' willingness and ability to delve into such higher level inquiries. This study examined young children's use of inquirybased materials and factors which may influence the level of inquiry they engaged in during informal science activities. An informal science setting was selected as the context for the examination of student inquiry behaviors because of the rich inquiry-based environment present at the site and the benefits previously noted in the research regarding the impact of informal science settings upon the construction of knowledge in science.

The study revealed several patterns of behavior among children when they are engaged in inquiry-based activities at informal science exhibits. These repeated behaviors varied in the children's apparent purposeful use of the materials at the exhibits. These levels of inquiry behavior were taxonomically defined as high, medium, and low within this study utilizing a researcher-developed tool. Results of this study have implications for the enhancement of inquiry-based science activities in elementary schools as well as in informal science settings. These findings have significance for all science educators, in both formal and informal settings, with regard to ways in which higher level inquiry could be facilitated and ways in which volunteers could engage visitors with open-ended exhibits at informal science settings. In the preparation of future teachers this findings of this study have merit for incorporation in teacher preparation programs in higher education.

### Malone College Chicago and Pine Ridge Mural Projects: Examples of One Community's Negotiated Pedagogical Iconography Designed to Understand the Semiotics of Another Community's Narrative

## Barb Moran Drennan Malone College Canton Ohio (USA)

# Abstract

This multi-syllabic title selectively invites a highly educated audience to a scholarly paper presented in journal rhetoric for the purpose of engaging peers in an interdisciplinary critical dialogue prior to, and following the publication of this article. It describes how a democratic pedagogy is enacted each time a small community of Malone College students travels out of state from their Ohio campus to another community for the purpose of negotiating an iconography (meaning of the images) for the purpose of painting a public mural for the host community. By thoroughly and patiently researching and negotiating the placement and colors of each image and combination of images of the mural with the host community, the initially naïve Malone community envisions a clearer picture and understanding of that community through the idiosyncratic lens of the host community's tacit self-concept. Unlike the semiotic confusion likely to be encountered by an international and inter-disciplinary audience attempting to navigate the abstract terminology of a discipline specific scholarly paper, the resulting public murals communicate with an aesthetic immediacy and simplicity. Each completed mural clearly illustrates the extent to which communication, understanding and respect has been developed between the two communities; and how this growing understanding and respect has literally begun to make this world a better place within which to live, one mural painted wall at a time.

# BUILDING COLLABORATIONAL THINKING SKILLS IN A WEB ENVIRONMENT: AN INSTRUCTIONAL DESIGNER'S PERSPECTIVE

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# INTRODUCTION

This paper briefly explores the key issues involved in the long-term development of adult collaborational thinking skills in a web-based forum, this from an instructional designer's perspective. That is, what are the androgogical considerations involved in devising experiences that promote the effective transfer of problem-solving skills to a team and technologically-oriented work place.

# **Designing for Target Skills**

Our position as college faculty in a Human Resource Development program at a mid-western university as well as independent consultants constantly drives home the point that increased emphasis is being placed upon critical thinking skills in the workplace. And, as decision-making becomes more decentralized, employees are expected to employ these thinking skills within the group context, making decisions effectively and efficiently. Project teaming is commonplace throughout the work world, whether in business, government, or academia.

As the internet becomes more and more ubiquitous, virtual project teams are also becoming commonplace along with the additional skill requirements for working in this environment. Persons must be able to form dispersed but nonetheless cohesive goal-based groups that facilitate optimum communication and problem resolution. With its various cultural nuances, globalization has heightened the attendant challenges of web-based collaboration while at the same time accelerating the need for web-based groups.

It is clear to us that we must consciously design instruction that meaningfully incorporates these skills into our curriculum. Although sometimes misunderstood, instructional design is simply planning, developing, evaluating and managing the instructional process effectively so that it will ensure competent performance (in this case, long-term performance) by learners (Morrison, Ross, & Kemp, 2001). As instructional designers, then, we must attempt to understand the factors involved in planning, developing, evaluating, and managing learner experiences that build the requisite skills and knowledge.

# Teachers Reflecting on Global Learning Strategies Across Content Areas

# Dr. Ana Gil Dr. Virginia Lebar Northeastern Illinois University Chicago, IL

# Abstract

Presently in the United States, educational reforms are targeting reading instruction as a means to improve the quality of educational delivery with the goal of making all students independent life-long learners. In fact, some states demand from higher education institutions that course work in reading instruction be a part of teacher preparation programs. I addition, some states require teachers to take reading across the content area courses in order to renew their teaching certificates. Maryland is one such state. This study examines a middle school that is using the Strategic Teaching and Reading Project, a nationally recognized research-based model as its reform program. This unit of analysis is located in Prince George's County, Maryland. In this qualitative experience, teachers were asked to reflect on their own teaching practices and experiences with the five global strategies of metacognition, prior knowledge, inference, word meaning, and text structure. For each strategy, an open-ended five-response instrument was designed an administered for five consecutive months. The instructional plan included teaching all five learning strategies in each content area while each department highlighted one learning strategy monthly on a rotating basis throughout the school year.

The *Strategic Teaching and Reading Project* assists teachers in becoming strategic facilitators of the learning process. Simultaneously, students gain the understanding of how to become life-long strategic learners by: thinking about their own thinking processes; recognizing what they know, their past experiences and feelings; increasing their knowledge of words and active vocabularies; examining the presentation of printed materials and purposefully producing their writing in a way that assists the reader; and developing critical thinking. The acquisition of these strategies carries across content areas. Not only do they transfer from class to class, these strategies transfer from one learning situation to another. Thus, students who engage in these strategies develop life-long strategic learning and thinking skills.

To this point, the findings reveal that teachers have become more effective on their teaching practices. They have reconsidered their ways of delivering course content, recognized their strengths and weaknesses, become increasingly cognizant of what, when, and how the five strategies can be implemented, developed a cognitive framework that outlines their lesson plans, and overcome initial resistance to using the strategies in their daily teaching practices. The current trends in education seem to demand that teachers embrace the idea of the "reflective educator." Basically, what this means is that if a teacher wants to improve his professional practices, he must carefully examine the situation that is taking place in a given time, precisely study the options available analytically, and make conscious choices on how to act. A reflective teacher is aware that "taking time and energy to reflect on and improve one's work are essential to the understanding process itself" (Simmons, 1994, p.23). For this reason, planning time for reflection help a teacher have a better understanding about his/her own teaching. Under this capacity, teachers may realize the critical aspect of their own reflections. They may find that the reflection time is productive, if they take time to properly reflect. Brubacher, Case, and Reagan (1994) found, analyzing many research studies, that educators are more reactive than reflective. In fact teachers and schools seem to be trapped in a reactive cycle of "catching up", "putting out fires", and "being on roller skates trying to plug up leaks in the dike."

# **ADULT LEARNERS IN 2001**

Gary Hoban, Ph.D. National University Beverly Neu, Ph.D. University of Southern California

#### Introduction

The world has become more and more dependent on technology. Institutions of higher education have turned to the Internet as an instructional technique to meet student's needs for credential programs. It is estimated that 700,000 people took online courses last year and that number is expected to balloon to 2.2 million by 2002 (San Francisco Chronicle, August 14, 2000). Colleges and universities have responded to student's enthusiasm for online instruction.

# Maintaining the Traditional Classroom Using On-line Resources

### Kuber Maharjan, Assistant Professor of Computer Technology Purdue University Joanne De Falla, Professor of English Miami-Dade Community College

# Abstract

Successful student outcomes in any course of study depend on the active participation of students during and outside of class. Traditional classrooms of the university system, which focus on lecture, student notetaking, and brief, question and answer sessions at the end of the class, limit, if not discourage active student participation. Following this paradigm, professors may find it difficult to ascertain comprehension of class instruction or provide adequate feedback to individual student concerns. Professors who deviate from the traditional mode of delivery in favor of more interactive learning experiences may fail to cover course content in a manner anticipated by administration and students. Undoubtedly, professors face ambivalent priorities as they create learning opportunities for students.

Computer technology offers a viable complement to the lecture-based classroom. Carefully scheduled, on-line assignments can be used to intervene at critical junctures to ensure student mastery of course content. These junctures include initial assessment of course competencies and objectives, periodic monitoring of comprehension of "home-work," bisemester assistance in preparing for mid-term and final exams, and systematic and timely feedback on individual performance. The adoption of on-line strategies to measure student preparation and progress affords a healthy compromise between traditional pedagogy in the classroom and the innovative computer technology capable of addressing individual student needs for the duration of the course.

# The American Net: Building Community and Results in Foreign Language Education

### Danièle Rodamar American University Washington, D.C.

Foreign language teachers, who teach skills that help build community, are often isolated. A K-12 language teacher is frequently the only person in the school who is fluent in that language—cut off from professional colleagues in his field and from the culture and community that give that language vitality. Professional development provided by the school or district usually has little to do with his instructional area. Is it any wonder that we lose so many new teachers, and that many language teachers who could excel never reach their full potential?

With increasing demand for foreign language (FL) education the number of language teachers has increased in recent years, from 2.8% of public school teachers in 1981 to 5.2% in 1996. The percentage of high school graduates who had completed year 3 or higher of a foreign language doubled from 15% in 1982 to 30% in 1998. The percentage of students completing no foreign language study decreased from 46% to 19%.

# Construction Zones for Lifelong Learning "Bridges to Lifelong Learning: The "We" in the Ivory Tower"

# Constance M. Ruzich Robert Morris College

# Introduction

Learning communities have received increasing attention and support in the last decade. Broadly defined, a learning community is "any one of a variety of curricular structures that link together several existing courses—or actually restructure the curricular material entirely—so that students have opportunities for deeper understanding and integration of the material they are learning, and more interaction with one another and their teachers as fellow participants in the learning enterprise" (Gabelnick, MacGregor, Matthews, & Smith, 1990, p. 19). The historical roots of learning communities can be traced to the work of John Dewey and Alexander Meiklejohn, who in the early years of the twentieth century

were concerned about the fragmentation of undergraduate education and who argued for reforming education so as to promote habits of mind which would prepare students for connecting knowledge to their lives and provide students with the foundations for lifelong learning. Early pioneers in developing innovative curriculum supporting student learning communities include Evergreen State College in Olympia, Washington, the State University of New York at Stony Brook, LaGuardia Community College, and Temple University. And almost ninety years since Dewey's call for connected knowledge and collaborative teaching and learning, interest in learning communities seems to have taken hold, spurred on by the publications of numerous books, reports and articles such as Shapiro and Levine's *Creating Learning Communities*, Lenning and Ebber's *The Powerful Potential of Learning Communities*, and Don Ebert's "Learning Communities and Collaborative Teaching" (appearing in the Fall 1999 issue of *The International Journal of Innovative Higher Education*).

Research reports and case studies on learning communities suggest that participation in a learning community increases student achievement, student involvement (defined as participation in class discussions, student participation in extracurricular academic and social activities, and student satisfaction), and student retention (Tinto, Love, and Russo, 1993). With the increasing pressure on institutions of higher education to compete for students and to assess outcomes of education, it is not surprising that learning communities have caught the interest of administrators, faculty, and students alike.

# THE SCIENCE BEHIND HI-TEK LEARNING

Victor Selman, KSB, The American University, Washington, DC Jerry Selman Era, Inc., WPB, FL

In questions of science, the authority of a thousand is not worth the humble reasoning of a single individual. ---Galileo

# ABSTRACT

To augment persuasion and articulation ability of business school students, stand-up comedy is used (<u>University of Chicago</u>). Song writing, storytelling and improvisation (<u>Vanderbilt University-Owens Management</u>), and Shakespearean motivation for other management skills at the corporate executive level (<u>Northrop Grumman</u>). Food "chow-down", before and during classes, including pizza and even chocolates (phenolics also lower the risk of coronary heart disease, serving as a dietary antioxidant), for relaxation and memory stimulation. The aromatherapy path to enhanced learning, the paths of music and other arts. with subliminal reinforcements---for example, the Mozart effect and "silent sound"--- and other sensory aids and techniques to activate all the senses for learning. Key for three, but strive for five---at least.

One well-documented novel learning way is by continual repetition through audio-visual media, where information is presented in a risk- /stress-free environment. Suggestion, auto-suggestion and suggestology---have been used, for example, to compress three years of studying French into less than one year by total immersion of students into a close network of parents- teachersactivities- environment, where, for example, only French is spoken.

Another approach is to have abstract ideas in the sciences translated into physical learning aids, or robotic devices. Or the new Hi-Tek toys--- where the kernel of the analogy can be retained for comprehending and identifying differing situations in the present, and for future metaphors.

# Lifelong Learning: An International Perspective on Adult Education for OPALs

### Doris Skelton, ED.D., NCC, LPC Kathy L. Keller, BA Southeast Missouri State University

# Introduction

This paper uses the word OPAL (the use of the term OPALS was coined by David J. Demco) to designate Older People and Adult Learning. In the essay that follows, the authors will use OPALs in referring to lifelong learners who are as valuable as precious gems to higher education and the communities that they serve.

In comparing international responses to adult education for OPALs, many similarities can be found as well as some unique differences. This is evident in the book "Higher Education and Lifelong Learners: International Perspectives on Change" edited by Schuetze and Slowey (2000), in which ten OECD (Organisation for Economic Cooperation and Development) countries were examined in regard to each country's interpretation of lifelong learning and their differing methods of implementation of adult education for non-traditional learners.

The authors begin by pointing out the increasing numbers of nontraditional students returning to higher education and the changing face of these students, concluding that the term non-traditional student may be an outmoded term. In the US, almost one-half of students attending college in 2000 fit previous descriptions of the non-traditional student (Schuetze and Slowey, 2000). Fischer (1992) reported that over 45 percent of undergraduate and graduate students were non-traditional, being over 25 years of age. The newest non-traditional learners differ considerably from their traditional counterparts in regard to age, marital status, family responsibilities, financial status, and employment status. Lamdin (1997) stated that the average age of college students has risen every year since 1970. In 1995, the average age of a student in higher education in the US was around 38 years of age. The once unusual or unique non-traditional students of the 1960s are becoming commonplace in 2000 and their numbers continue to grow.

# Technology for Lifelong and Effective Learning for School Counselors

# Carolyn B. Stone, Ed. D. Associate Professor, Counselor Education University of North Florida Jacksonville, Florida 32224

# Introduction

The school counselor who uses technology effectively has powerful skills to ensure their professional development, lifelong learning, and success with students. Technology is one of the most neglected skills in the preparation program for school counselors as noted by the absence of the mention of school counselors in the barrage of educational reports about using technology in education (Hartman, 1998; Stone & Turba, 1999).

School counselors have been slow in exploring technological advances for offering better services and the adoption of computer technology by counselors has lagged far behind adoption by other educators and other occupations (Casey, 1995). "Infusing technology into the guidance suite . . . will require a concerted effort . . . technology has the potential to enhance and change forever the way school counselors support teachers and foster student development" (Hartman, 1998, p. 3). School counselors are beginning to discover the power of technology as a critical tool for helping them 1) advocate and monitor student access and success in academics, 2) complete career planning, and, 3) acquire and access data needed for advocacy to inform decision-making of individual students and of the entire school.

# The Continental Shift in Education: Global Learning from Asia to Africa

# Dr. Bruce C. Swaffield Malone College Canton, Ohio

#### Introduction

It is staggering to realize, in this modern age of high-speed computers and almost instant satellite communications, that approximately one-sixth of the world's population is illiterate (UNICEF 1999). Even more alarming is the thought that this figure may be two or three times higher if it included the millions of people who are grossly under-educated. On every continent, nations from Malaysia to Kenya are struggling to make education both a priority and a reality. Economic conditions and a myriad of social problems, however, are leaving billions of children and adults without even the basics of reading and writing.

There are no easy solutions to this worldwide dilemma, but numerous traditional colleges and universities – with the help of governments and industry -- are developing new programs that promise to vastly improve both public and private educational systems all around the globe.

# LEARNING BY DOING : THE POWER OF THE 'HANDS ON' APPROACH

Professor Don Westwood Carleton University School of Architecture Ottawa, Ontario Canada

#### Introduction

The biggest mistake we, as teachers can make, is to confuse **information** with **knowledge**; to assume that being **told** about something is somehow equivalent to **understanding** what has been said; in other words, to assume that information and knowledge/understanding are the same thing. And that distinction isn't as obvious as it at first seems; consider the following true experience of mine.

I had mentioned in a lecture the 'prima donna' attitude of some architects; the student had written 'pre-Madonna' in their course note-book! That's rather funny, of course, but on reflection it is in fact very serious; what on earth did the hearer think I meant!? So it was to a large extent my fault. It was my presumption that he or she even knew what opera was all about, let alone some of the terms used! And I had further assumed that that analogy would be understood, and would therefore help them to better understand what I was talking about!

Today, there is now an alarmingly serious arena for the continuance of this acceptance - that 'being informed is the same as being educated' - and that is the **Internet**. A seemingly infinite amount of information is available; but where is the '**filter**', the '**librarian**', the equivalent to the person or institution or system that would sift the genuine from the bogus? And who is there to ensure that the context is understood? Where is the essential '**catalyst**', the **teacher**, the incentive for the receiver to turn what is authentic into knowledge and ultimately into understanding?

This dilemma could be seen as equivalent to sitting a student in a comprehensively stocked library and saying 'go ahead, read, anything you like, and educate yourself', and assuming that that it is the same thing as <u>being</u> educated, - in a formal classroom, or wherever today's equivalent may be!

Some students are, of course, self-motivated, but the majority aren't until someone or something instills in them an enthusiasm to learn; and **we** are in the business of **helping the most** to **become the best** that they can be. Indeed, most of us do spend far more time with the weaker C students than they do the As, and that's fine; that's how it should be; that's what we are chiefly employed to do! Because we are not merely the providers of information; we are there to help to motivate the student into turning information into knowledge, to assist them in becoming truly '**educated**'; and the only way we can do that is to instill in them

#### a curiosity and enthusiasm to learn.

So: how can we achieve this?