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# School of Design

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# MESSAGE FROM THE DEAN

Marvin J. Malecha, FAIA

EACH GENERATION

MUST FIND ITS OWN

APPROPRIATE

FORMS AND EXPRESSIONS,

SPRINGING OUT OF ITS

PRACTICAL NEEDS

AND ITS IDEAL AIMS.

lewis mumford, 1950

SCHOOL OF DESIGN BULLETIN

# SETTING ON TO THE PROPER COURSE

The individuals who set the School of Design on a course of events more than fifty years ago, defined the journey by clearly articulated values. The concept of architecture as an art of humanizing the environment was complemented by embracing a spirit of constant curiosity that was fueled by a passion for making and doing. But even more important was the notion that a good design education nurtures good citizenship. The intention of the founders to establish a strong compass of values assured the supremacy of the individual over any form of technology, subjugating it to its proper role in service to humanity. Within this philosophy the principles of good design are directly related to the essential tasks and goals of a healthy democracy. And, the concept of regionalism pervades all that was done, even while the most distinguished design professionals of the time, from many cultures and countries, were frequently present in the School. The School of Design was conceived of as an institution of its time and place, driven by a passion for the design process, and thoroughly modern, rejecting the preconceptions associated with the past. While the School of Design, in its earliest days, was primarily an Architecture and Landscape Architecture program, these values continue to inspire what has become a diverse, rich design community.

Today we must set the course for the next fifty years. Our inspiration is to stand on the shoulders of those who have come before us so that we may strive to even greater accomplishments. This journey will be inspired by a continuing commitment to the design process as a way of seeing and proceeding. It will be characterized by an ever more diverse and enriched world. The world that confronts us is continually reconfiguring. Teams of individuals are required to meet ever more specific tasks, demanding a broad knowledge base rather than specific credentials. Yet it

will continue to be a world dependent upon individual intellectual entrepreneurship and accountability. These persistent themes and enduring values will inspire design practice and education.

## CELEBRATING THE PROCESS

A design education is rooted in the study of a thought process and a way of seeing the world that is both reflective and critical. It is a celebration of disciplined thinking. The design process remains the most important asset of the designer. In a world where information is transforming our understanding of all that we do, it is process, not style which must direct our actions. The School of Design, in an age of new technologies evolving at a rate never before experienced, must inspire students to assert control over technology thereby humanizing a process that is easily distracted by tools. Design thinking will equip the individual with the means to direct life, to be prepared to respond to any situation in an inspired fashion. Process thinking defines mental discipline. It is a quality of thought that assures important posed questions will be addressed. A guiding design process is the equivalent of igniting the energy necessary to overcome difficult problems.

## EMBRACING DIVERSITY

A design education must embrace every form of diversity as the very essence of its experience. In many ancient cultures the concept of light emanating from light describe the birth of gods and the very notion of creation. As the birth of the scientific method began to define the human search for knowledge, the concept of light became even more complex as even a single beam of light was understood to be a spectrum of color. Understanding color theory with this perspective is the very essence of the designer's language. It is the inspiration for the manner by which the design process must embrace every good idea. The School of Design must foster diversity in all that we undertake. A diversity of thought, cultural inspiration, and gender perspectives insures the vitality of design. The presence of diversity nurtures curiosity and creativity. The accomplishment of a truly diverse community within the School will require a considerable commitment of resources. A responsible design community must undertake every possible action including; curricular reform, a diverse program of visitors to the School, and aggressive recruitment from every part of the community. An increasingly diverse world demands of the School an increas-

ingly open and enlightened learning environment. The School must be the prism which reveals the wondrous diversity of a single beam of light.

## ACCEPTING CONTINUAL RECONFIGURATION

A design education must be an experience of continual reconfiguration, questioning, and exploration. The dichotomy of caring for and imparting the legacy of a discipline, and the need to seek knowledge for the very survival of the discipline, creates a stressful situation for traditional structures. A discipline will be rapidly co-opted if the individuals within it remain determinedly fixed on a single way of seeing. The comprehensive office has evolved toward a team of practitioners assembled specifically to address the needs of a particular project or building type. Teams are comprised of individuals from diverse backgrounds, representing an array of professions. Team members, who may never have worked together before, are often brought together for a single project with the possibility that they may not work together again. Individuals cast in these roles must have the ability to move across bodies of information and relate to diverse professional and cultural value systems. The individuals who can not continually redefine themselves will certainly fall out of a reconfiguring organization. Such a dynamic model raises ques-

#### FOCUSING ON THE WORK

A design education is an intense experience founded on a specific definition of work, the creation of artifacts, organized in a social structure that begins with the competency of the individual. The university, and therefore the School of Design, will be transformed by the concept of organizations as networks of competencies among individuals in a social framework. The fluidity of this new structure works counter to the historic organization of academic units into fixed administrative departments as well as the organization of design practice as compartmentalized responsibility. Disciplines of study must seek the gray zones that define the opportunities in the networked reality of social organizations. Bodies of information on which disciplines depend for their self-identity, have become so dynamic that they will only survive they adapt to information flows from and to many sources related to

tions of coherence in action, team leadership, accountability, and the importance of a common vision among a team with frequently divided loyalties. Cross-functional behavior is the foundation of a reconfiguring organization and the underlying inspiration for individuals who are on a continual learning path.

specific functional capability. The organizations of the future will yield to ever smaller units founded on specific capabilities. This will promote greater interaction among diverse interests of the university facilitated by the need to build functional relationships. The pursuit of many different initiatives simultaneously within a social network effectively allows every aspect of the network to remain directly involved with the accomplishment of the work, rather than some indistinguishable aspect of the work.

## THE INDIVIDUAL AS A HUMAN RESOURCE

A design education must instill a sense of personal worth and intellectual curiosity in the individual. Intellectual freedom gains definition when ideas evolve with great exuberance. Individuals committed to a single mode of thought, like the individual of fixed duties, have become a burden to professional study. Even the most specialized historian must be prepared to seek new insights to ancient precepts. Education must evolve from a focus on protecting a body of work, to the concept of nurturing the individual as a maturing resource. Issues such as organizational fit, the willingness and ability to work

in cross functional situations, and the openness to continual learning will be defining characteristics of the designer. Individuals with greater latitude to form the cross functional relationships will foster new disciplines.

#### ACCEPTING ACCOUNTABILITY

A design education must instill a personal sense of accountability for culture, environment, and the human condition, within the individual. Traditional notions of credentials will give way to accountability through performance. Society is evolving too rapidly for any single set of educational experiences to be uniquely appropriate. The ability to get the work done in such dynamic situations will undermine traditional notions of academic credentials, accreditation and licensure. Curricular experiences must therefore be established to focus education and practice on capability and reflection rather than specific unchangeable bodies of knowledge. Such expectations are stimulating educational paths as diverse as the interactive internet, traditional distance learning courses, community based work and credit for work experience.

The professional design curriculum embodies the values attributed to the credentials that distinguish individuals. A continually reconfigurable strategy for the professional curriculum reflects

the continual reconfiguration underway within the successful design practice. With every aspect of professional practice, licensure, and study, continually reconfiguring, accountability for the educational organization will migrate directly to the individual student and to the professional constituencies of a university. Direct individual accountability will be reflected in society's expectations for design professionals.

## COMMENCING ON TO THE JOURNEY OF THE NEXT FIFTY YEARS

The earliest organizing principles of the School created an awareness in the designer to understand the patterns of nature, to make every designed artifact accessible to the broadest possible population, and to reflect and express the period which encompasses his or her work. Change will continue to characterize the future bringing individuals of diverse talents together while placing importance on greater amounts of specificity. The individual as a resource is becoming more important since we must rely on each other to a greater extent to place this specificity into the context of many design approaches. In spite of the increasing importance of teamwork and cross-disciplinary activity, individual entrepreneurship and individual accountability will continue to drive culture and society. Such a realization drives the School toward the curiosity that inspires the search for knowledge. It is a realization that instills the need to relate education to the needs of society while preparing students to be productive members of the design community and good citizens. Scientific and technical curiosity informed by social and moral responsibility—was determined at the initia-

tion of instruction to be the essential experience of the School of Design. The School of Design community remains committed to this noble principle.

BECAUSE CHARACTER,
A PROFOUND DEVOTION,
AND AN ABSOLUTE
PROFESSIONAL

COMMITMENT ARE PRIME
INGREDIENTS OF ANY
CREATIVE ACTIVITY
WHERE THE SOCIAL
RESPONSIBILITIES
ARE AS VITAL AS IN
DESIGN, WE FOSTER
AND CULTIVATE THE
INTEGRITY OF
THE INDIVIDUAL.

henry kamphoefner, 1950

SCHOOL OF DESIGN BULLETIN

THE FREE PURSUIT OF KNOWLEDGE IN A SOCIETY

THAT IS CONTINUALLY RECONFIGURING, DEMANDS THAT THE INDIVIDUAL BE PREPARED FOR A LIFE IN DESIGN

THAT IS CHARACTERIZED BY A UNIQUE WAY OF SEEING, EMBRACING WONDROUS DIVERSITY, RESPECTING

THE CREATION OF THE ARTIFACT, RECOGNIZING THE HUMAN BEING AS A MATURING RESOURCE, AND FOUNDED

ON PERSONAL ACCOUNTABILITY. THE DESIGN ACT, EVOLVING FROM THIS PHILOSOPHY, IS A CONTRIBUTION TO THE LEGACY OF HUMANITY.

marvin j. malecha

# Design Camp 1998

# Casting A Wider Net



OTO BY BILL B.

FOR THE PAST fourteen years the School of Design at North Carolina State University has sponsored an awesome Design Camp, and this year was no exception! Design Camp 1998 kicked off on Sunday, June 21 and concluded on Friday, June 26. Participants from thirty-five cities and five states were greeted by director of student affairs and design camp, Marva C. Motley who was accompanied by teaching assistants, faculty and design school staff. Following a brief orientation, students were introduced to their first design problem and began work within hours of their arrival.

Campers had just enough time to register and get settled before it was time to say good-bye to family members and to begin an experience that—as many campers stated, "would never be forgotten." In a traditional venue, the camp format was planned to offer maximum exposure to architecture, graphic design, industrial design, and landscape architecture, and that goal was accomplished. From early Sunday evening to midday Friday, students spent hot days and nights in studios, working feverishly to respond to design problems they were assigned in different disciplines. By Friday, campers and teaching assistants were exhausted, but the final critique revealed a wealth of talent and creativity, just waiting to be groomed.

This year the camp format was structured to push the creative limits. Professor Art Rice, Department Head for Landscape Architecture set the stage for his "alien habitat" project by showing a clip from the popular movie "Men In Black." Students were expected to build a an alien habitat from limited supplies, addressing the environmental needs of the creatures from beyond earth's boundaries. Alstromerians, naelcs, and eegits were among the creatures that required different and rather specific dwelling places. Other projects included graphic designer Kermit Bailey's black square problem, architect Susan Cannon's deserted island lookout tower, and industrial designer Percy Hooper's convertible lunch pack. Campers met the challenge with somewhat sophisticated responses to these design problems. In addition to studio projects, participants attended lectures presented by exhibit designer Jane Eckenrode from the NC Museum of Natural Science, industrial designer Tim Buie and landscape architect Mary Myers.

At its inception the purpose of Design Camp was to expose high school students to careers in design, particularly students from underrepresented areas and backgrounds. Through local and national advertising, casting a wider net has

resulted in increased diversity among camp participants. This year's demographics reflected greater diversity than any since the camp has been offered. Thirty-eight females and forty-two males from across North Carolina and as far away as Harrisburg, PA participated. Minorities and/or students from rural areas comprised approximately 35% of the enrollment. Because of Design Camp's exciting format and the involvement of well-known design professionals, the camp has become so popular that enrollment has reached a maximum cap of eighty students annually. Alumni and businesses are strong supporters of the camp and have sponsored promising high school students in the past. The camp has become an excellent recruitment tool by allowing participants the opportunity to "experience design" before finalizing their career choices. Although participation in the camp does not guarantee admission to the School of Design, each year about ten percent of the admitted class indicate that they have participated in Design Camp.

Thanks to an energetic team of teaching assistants, faculty, staff, guest lecturers, and community supporters, this years camp exceeded expectations!\*

# Designing for the 21st Century

# A First-Ever International Conference on Universal Design

# DESIGNING FOR THE 21ST CENTURY:

AN INTERNATIONAL CONFERENCE ON THE UNIVERSAL DESIGN OF INFORMA-TION, PRODUCTS AND ENVIRONMENTS, was held at Hofstra University, New York, USA from June 17–21, 1998. The conference was an international showcase of the practices and products of universal design. During the conference, participants met experts from around the world who are creatively responding to the challenge of design that recognizes human diversity. Conference topics ranged from universal design in private homes to museums, the hospitality industry, the Internet, computers and telecommunications, play space, transportation, indoor air quality and acoustics.

Universal design displaces the mythical 'average' consumer. It presumes that good design accommodates human differences and works better for everyone. The confluence of demographics—78 million baby boomers in the U.S., the world's longest life expectancy in Japan, and the law—the Americans with Disabilities Act, as well as countless local laws and codes are catalysts for exploding interest in universal design.

"The conference was really about promoting the practice of universal design," says Larry Trachtman, Executive Director of The Center for Universal Design, one of the conference co-sponsors. "Over 450 people, from more than 20 countries, came to this conference to learn how design experts, major companies and design educators are revolutionizing the way they design, produce and teach. It was extraordinary to see the innovative approaches from around the world. We know why universal design is important, this conference helped us better understand how to do it. Our challenge now is to reach beyond the 'choir,' to be strong advocates and to sell universal design to policy makers, industry and the public at large."

Designing for the 21st Century conference exemplified innovations in universal design and practice throughout the world. The extensive program offered over 65 interactive sessions with more than 100 international presenters throughout the five days. The conference included pre- and post-conference intensive workshops, exhibits of student and professional work, manufacturers' exhibits, networking sessions, a media room and a closing reception held at the United Nations.

The Center for Universal Design coordinated the Student Design Competition, with Center Founder and Program Director Ron Mace serving as lead juror. The challenge addressed in the competition was to create "A Community Gathering Place for the 21st Century" that would attract and accommodate people of all genders, ages, sizes, abilities, and cultures. The competition and exhibit recognized exceptional performance by students in striving to meet the goal of inclusion through universal design. Four awards were given, including the School of Design's Donald Buffoni for his Public Access

Machine. Professor Glenn Lewis served as faculty advisor.

The conference was sponsored by Adaptive Environments Center, Boston, MA; The Center for Universal Design, School of Design, North Carolina State University, Raleigh, NC; Eastern Michigan University, Interior Design Program, Ypsilanti, MI; Hofstra University, Department of Counseling, Research Special Education and Rehabilitation, Hempstead, NY; and Universal Design Newsletter, Takoma Park, MD. National and international collaborators included the American Association of Retired People, American Institute of Architects, E & C Project of Japan, the Design for Aging Network of the European Union, and the World Institute on Disability.

Major speakers included: Donald Norman, author of "Design of Everyday Things"; Patricia Moore, Moore Design Associates; Roger Coleman, DesignAge, Royal College of Art; Cynthia Leibrock, co-author of "Beautiful Universal Design"; John Scott, Disney; Ronald Mace, Center for Universal Design; Frank Bowe, Hofstra University; John Salmen, Universal Designers and Consultants; and Gregg Vanderheiden, Trace R&D Center

The Center for Universal Design compiled and edited the conference Proceedings. Copies are available from the Center by calling 919-515-3082, or at cud@ncsu.edu. The cost is \$40.\*

#### IN MEMORIAM



Ronald L. Mace (B.Arch. 1966), founder and program director of the Center for Universal Design, died of natural causes in Raleigh on June 29, 1998.

Born in Jersey City, NJ in 1941, Ron contracted polio at the age of nine. He grew up in Winston-Salem, NC and graduated from the School of Design. After four years of practicing conventional architecture, he became involved in the effort to produce the first building code for accessibility in the nation. This code became mandatory in North Carolina in 1973 and served as a model for other states. Ron's pioneering work in accessible design was instrumental in the passage of national legislation prohibiting discrimination against people with disabilities, the Fair Housing Amendments Act of 1988 and the Americans with Disabilities Act of 1990. He was a design pioneer and visionary responsible for the concept of "universal design," a belief that good design addresses the needs of all people, regardless of their age, ability or status in life.

Ron was Principal of BFE
Architecture and Research Professor in the Department of Architecture.
In 1989, he established the Center for Accessible Housing (later renamed the Center for Universal Design) at the School of Design. He was a fellow of the American Institute of Architects and received the Distinguished Service Award from President Bush in 1992 for promoting the dignity, equality, independence and employment of people with disabilites.

Memorial contributions may be made, if desired, to the Ronald L. Mace Memorial Fund, c/o Center for Universal Design, Box 8613, NCSU, Raleigh, NC 27695–8613.



The School of Design celebrated its 50th anniversary April 14–18 with a week's worth of events:

The School hosted the EUROPEAN
ASSOCIATION OF ARCHITECTURAL
EDUCATORS (EAAE) and the
ARCHITECTURE RESEARCH CENTERS
CONSORTIUM (ARCC) for a joint
conference on research in design
education. This was the first time
these two groups had met jointly,
and the first time that the
EAAE had met outside the
borders of Europe.



The Contemporary Art Museum (formerly City Gallery of Contemporary Art) organized and curated "50 YEARS IN THE MAKING", a retrospective of faculty work, which was exhibited at the North Carolina Museum of Art. The opening reception coincided with the opening of the EAAE/ARCC conference.





Nearly 400 alumni returned for a reunion on Friday and Saturday, which included a SYMPOSIUM on the future of technology in design education, a TGIF RECEPTION. the BEAUX ARTS BALL, and activities throughout the day on Saturday. Professor JOHN REUER'S FINAL LECTURE on the history of design was a highlight, as was the **DESIGN GUILD BANQUET** On Saturday evening, at which former professors George Matsumoto and



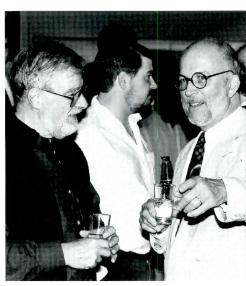


Duncan Stuart were honored.











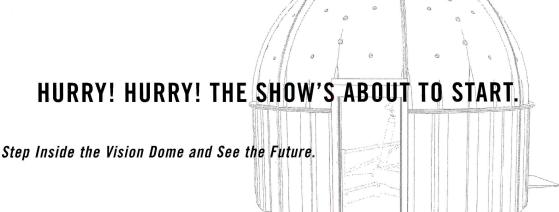












by Mark Armagost

WHERE CAN YOU CROSS TIME AND SPACE TO SEE THE FUTURE? Where can you travel the Blue Ridge Parkway to see if construction will obstruct the spectacular views? Where can residents, urban planners, city councils, and developers see the impact of different development strategies? Where can architects, designers, customers, and end-users gather to review plans for a new house, shopping mall, or office building?

In Brooks Hall, that's where. Starting this fall semester, "the Design Research Laboratory will be fully equipped to deal with threedimensional computer modeling," said Jay Tomlinson, director of the laboratory. The centerpiece will be the VisionDome. For example, the VisionDome, manufactured and donated in-part by Alternate Realities Corporation, will allow designers and clients "to interact with the proposed design and space of a building to visualize the plan in a photo-realistic way to be as close to reality as possible," said Tomlinson. By combining computer-generated 3-D models with advanced projection equipment, the viewers will be immersed in the design. "The immersive experience is the key to allowing the designer and clients to explore the design in a real scene," said Tomlinson. "They can interact with the design as if they are standing inside the design."

So, what does the VisionDome look like? The VisionDome is a small spherical-shaped room that contains a white image-surface measuring five meters by five meters. The rest of the interior of the room is black. If you picture a planetarium, then the image portion has slid down from the ceiling and tilted across the wall stretching from the floor to the ceiling. When you look straight forward, you see the center of the screen, which expands in all directions to completely fill your field of vision. An advanced Ampro projector and an especially designed optic system, which looks like a small periscope, places the computer generated image at the center of the screen and projects it in all directions to completely fill the screen. By standing at a railing in the center of the dome, up to ten people can view the image.

The VisionDome produces photo-realistic, 3-D images that fill your entire field of vision, including your peripheral vision. "Computer-

generated 3-D modeling is the next generation of modelbuilding," said Tomlinson. "Just as flat, two-dimensional computer screens have replaced the building of miniature models, 3-D modeling will replace computer screens."

A computer-generated model allows the designer to create a photo-realistic environment, down to wallpaper and the fabric texture on a coach. With the aid of the VisionDome, the designer will move through the computer-based model using point-and-click technology.

Tomlinson believes that the greatest application of the VisionDome lies in the interaction between people. For the first time, architects, designers, clients, and end-users can see the design, but can actually, well virtually, move through the model. The designer can share his or her vision with others, which should result in a better meshing between the designer's vision and the client's desires.

Tomlinson is excited about the possibilities the VisionDome will present to the Design Research Laboratory. The Laboratory is divided into three sections: Computer Generated Immersive Environments, Advanced Media and Information Design, and Environment Visualization and Simulation. The Laboratory offers an environment where students and faculty from a variety of disciplines can perform research or receive training on advanced computer-based imaging, modeling, and simulation.

The work performed in the Laboratory bridges the gap between design and science, according to John Fels, Ph.D., who works on environmental modeling. Botanist and soil scientist joined forces to help create a vegetative map of the Chattooga River watershed for the National Forest Service. The physical characteristics, such as elevation, slope, and site exposure, as well as a survey of the individual species and plant com-

munities of 500 sites were determined. Using an algorithm and statistical models developed at NC State, Fels generated a Multi Attribute Digital Terrain Model of the watershed. The model was used to predict the types of vegetation and the vegetative communities expected to grow in particular areas of the watershed.

Predictive vegetative mapping (PVM) provides an extremely accurate model of the watershed. In the future, panoramic photographs taken from precise locations, as determined by the Global Positioning System, will be feed into the model. The computer-generated model will incorporate the photos into the PVM to render a photo-realistic, 3-D image of the watershed. Using the VisionDome, researchers will simulate hiking the virtual watershed to see the predicted vegetative growth in one year, five years, ten years, or 100 years.

The analysis of potential building sites is greatly enhanced through digital terrain models. These models allow developers and planners to determine which surfaces, high and relatively flat, to build on and which surfaces, low spots, steep slopes, and flood plains, should be avoided. The Laboratory used digital terrain models to prepare a preliminary analysis of the Centennial Campus and to plot a highly accurate map of the watersheds in North Carolina, which middle school teachers throughout the state use to teach geography.

The laboratory participates in number of outreach projects. The North Carolina Community Activism and Design Outreach (NC CAN DO) specializes in "assisting community members to participate in planning and designing their communities," said Matthew Dubé, director. NC CAN DO brings NC State students and faculty advisors together with property owners, developers, planners, and government officials to determine problems with a specific area, to determine desirable uses for that area, and to identify solutions.

After the problems and solutions are identified, NC CAN DO creates digital images of the area using layer enhanced imaging (LEI). LEI incorporates digital photographs with computer-generated models to depict how the proposed designs will change the community. When these models are projected in the VisionDome, representatives from the concerned groups will virtually walk through the proposed design. Or, if the design would be viewed best from a car, they could take a virtual van ride through the redevelopment area to see how their town will look.

Outreach is a vital component of the Media and Information Design section, which deals with designing web pages. "We are just learning how to use the internet to teach," said Tomlinson. "When used as a distance learning device, the internet allows the student to gain a better understanding and context of the material." One example of what Tomlinson means is found at the web site for the North Carolina Museum of Art, http://www2.ncsu.edu/ncma/.

The most important aspect of web design is immersion, according to Tomlinson. The users of the web site gain a greater appreciation of the artwork by seeing the pieces in the context of the museum. However, because of the web technology, the users can find out details about the art works with a simple click of the mouse. The NC Museum of Art site will be updated so the user, when taking the virtual tour, can select the individual art works to learn more about that particular piece.

By visualizing the Art Museum through the web site, teachers can provide their students with a large amount of information. The ideal distance-learning tool enhances and expands but does not replace in-person experiences. For the Art Museum, teachers use the web site to instruct their students about art works before a field trip to the Museum. In this manner, the visualization provided by computer technologies enhances the learning experience.

As computer technology becomes increasingly complex, scientific visualization plays an increasingly important role in everything from building web sites to creating predictive models. Instruments, such as the VisionDome, will enable a group of people to view simultaneously the same virtual reality model while discussing it.

As technology advances, we can map almost anything from molecules to galaxies, according to Fels. By combining these maps with computer generated models, anything, regardless of scale or time constraints, can be viewed. "The real strength of the VisionDome is that a group of people can collaborate to explore conceptions in a photo-realistic, 3-D environment," said Tomlinson.

NC State students and faculty will use the VisionDome in the Design Research Laboratory to demonstrate their designs and share their concepts. Not only will they create the look of the future, but they will show you how the future will look. With the VisionDome, these designers are, conceptually and literally, creating visions of the future. If you have ever wondered what a drive down Blue Ridge Parkway in 50 years may look like, stop by Brooks Hall—they can show you.\*

# lifelong ... g

Unless changes are made, we are in danger of producing a generation of adults who lack the basic thinking skills for survival in the next century.

**U.S. LEADERS** generally agree that adults who are successful have flexible thinking skills and the facility to acquire and apply new knowledge and skills to unfamiliar tasks and settings. In a time of rapid change, it is this ability to adapt learning and develop new problem-solving strategies that determines success.

Most K-12 curricula reflect a time when it was possible to learn a well-defined body of knowledge that society agreed was critical to adult life and work. But today, given our rapidly changing world, learning strategies that emphasize storing facts in memory are inadequate. When faced with this sort of education, students' motivation to learn understandably wanes because they see no immediate relevance to their own lives of either the facts or the learning methods they are taught. Unless changes are made, we are in danger of producing a generation of adults who lack the basic thinking skills for survival in the next century.

Schools that do teach thinking processes frequently emphasize linear "recipes" that may or may not match the divergent nature of contemporary problems and students' own preferences for learning. In many cases, the process becomes another fact to learn, a procedure without context or applied value in the student's world. The task for educators is to reinvigorate learning and to model the integrated, dynamic processes we expect students to use as responsible, successful adults.

The research for this book suggests that using design experiences in the classroom accomplishes that task. Teachers report that their primary motivation for using design is to help students acquire the necessary competencies to meet new challenges throughout their lives. At the top of teachers' reasons for making design a critical part of their curriculum and teaching strategies are:

From Design as a
Catalyst for Learning,
by Meredith Davis,
Peter Hawley,
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- ♦ ENHANCING FLEXIBLE THINKING SKILLS,
- PROMOTING SELF-DIRECTED LEARNING AND ASSESSMENT
- DEVELOPING STUDENTS' INTERPERSONAL AND COMMUNICATION SKILLS, AND
- CULTIVATING RESPONSIBLE CITIZENS.

Research evidence suggests that the design process is an innovative model for strengthening students' creative problem-solving skills.

Because the design process concerns itself with "that which does not yet exist," it encourages learning behaviors that prepare students for an environment of change.

To enhance students' thinking skills, educators must instill in students a process for creative problem solving that transcends individual assignments, illustrates how learning applies to students' everyday lives, builds relationships across traditional school subjects, and increases students' comfort with the uncertainty that characterizes many problems. In addition, assessment must become a matter of students' internal accountability for the achievement of high standards.

## STRENGTHENING CREATIVE PROBLEM SOLVING

Developing and strengthening creative problem-solving skills is a more difficult challenge than it appears. Education researchers define maintenance learning as the acquisition of fixed outlooks, methods, and rules for dealing with known and recurring situations. Innovative learning, on the other hand, questions assumptions, seeks new perspectives, and facilitates transfer to new problems and settings. While curriculum can easily challenge students to solve problems, it must work very hard to teach processes and ways of thinking that transcend assigned tasks (Nickerson, Perkins, and Smith 1985).

Research evidence suggests that the design process is an innovative model for strengthening students' creative problem-solving skills. Because the design process concerns itself with "that which does not yet exist," it encourages learning behaviors that prepare students for an environment of change.

Willamette Primary School in West Linn, Oregon, is explicit in its use of the design process. Teachers employ design in curriculum development and their own study of education; students discuss the process and use it to solve a variety of problems across disciplines. Classes always document their process in notebooks, on bulletin boards, or in classroom and hall displays. For Willamette, the design process consists of these iterative problem-solving steps and questions:

- DEFINE THE CONTEXT AND THE PROBLEM. WHAT DO YOU WANT TO KNOW, AND WHAT DO YOU ALREADY KNOW ABOUT THE PROBLEM?
- PLAN AND CONDUCT RESEARCH. HOW WILL YOU CONDUCT THE RESEARCH? WILL YOU OBSERVE, READ, INTERVIEW, SKETCH, OR BUILD MODELS?
- GENERATE CRITERIA FOR A SUCCESSFUL PROBLEM SOLUTION. WHAT IS THE RUBRIC OR SET OF CRITERIA AGAINST WHICH YOU WILL MEASURE PERFORMANCE?
- GENERATE SOLUTIONS. WHAT ARE THE ALTERNATIVE SOLUTIONS?
- IMPLEMENT. HOW CAN YOU REALIZE AND TEST THE BEST SOLUTIONS?
- EVALUATE. WHAT WERE THE CRITERIA ADDRESSED BY THE SOLUTIONS? WHAT NEEDS MODIFICATION TO BETTER MEET THE PERFORMANCE CRITERIA?
- REFLECT ON THE PROCESS. WHAT WAS DONE THROUGHOUT THE PROCESS? WHAT WAS EFFECTIVE? WHAT COULD HAVE BEEN IMPROVED?

Scott Wavra, a 4th and 5th grade teacher at Willamette, illustrates this process as he describes the efforts of students in designing a home for their pet snake.

My class needed to design and construct a cage for an eight-foot python, who could only stay in the classroom if the class was able to house him. The children asked questions about the needs of snakes and then studied reference books and collected information about large snakes. Cage criteria were listed by the group. Children sketched at least three designs {for the cage}, each incorporating the learning from their research. Then the class pooled the different ideas and developed a rubric of critical design elements.

Teams of children discussed options and created a group plan. They were taught how to draw their plans to scale orthographically, and then they brainstormed the types of materials construction would require. The teams made a corresponding list of prototype materials (for testing their ideas). They calculated the viewing area (area) and the room the snake would need to move (volume). Each team developed a budget, constructed scale prototypes, and tested them with a smaller garden snake. Each group prepared and gave a persuasive speech about the most effective elements of their design.

Education researchers define maintenance learning as the acquisition of fixed outlooks, methods, and rules for dealing with known and recurring situations. Innovative learning, on the other hand, questions assumptions, seeks new perspectives, and facilitates transfer to new problems and settings.

As David Perkins notes, "Design in education with reflection (on process) offers opportunity for students to take the learning from one problem and extend it further. It creates the chance for teachers to move students from the immediate concrete problem to general processes of problem solving that can be applied elsewhere."

The whole class used that information to develop the best cage with all of the best elements of each presentation, and put together one last blueprint to request construction funds from the school administration. Once those plans passed inspection, the children built the cage, complete with heating and lighting.

This is powerful learning that replicates what society demands of successful adults. It begins with a highly motivating problem: keeping the live snake in the classroom. Students analyze this problem and set the appropriate criteria against which their solutions will be judged. The assignment drives their search for facts; they acquire knowledge within a context and make active use of it. Resources and their uses are self-determined and, therefore, highly motivating.

In addition, the problem demands that they move back and forth through visual/spatial, linguistic, and mathematical thought and communication. Students link concepts from science, mathematics, construction technology, economics and art. They weigh each choice against a preferred outcome, and they act as contributing members of a team in making decisions. This design-based learning experience teaches students a problem-solving process they can adapt to many situations. They learn about reptiles, building, and habitat in ways that dramatically increase the likelihood of retention. Best of all, they leave the classroom feeling successful about learning and anticipating the next day's events.

The research team noted numerous instances in which teachers and students reflected on their problem-solving processes. At such times, teachers made conscious attempts to comment on the process and remind students of other circumstances in which the process might be helpful. As at Willamette, many schools use journals in which students record their thoughts about design experiences. Dolores Patton, a 3rd and 4th grade teacher using Doreen Nelson's City Building Education at Open Charter Magnet Schools in Los Angeles, California, asks students to write about their methods, diagram or illustrate them, and post their drawings on the class "history wall." This serves as an enlarged journal record of the problem-solving process. The wall constantly changes with each addition, modeling the dynamic process of creative thought.

As David Perkins notes, "Design in education with reflection (on process) offers opportunity for students to take the learning from one problem and extend it further. It creates the chance for teachers to move students from the immediate concrete problem to general processes of problem solving that can be applied elsewhere" (Brandt 1986).

At Locust Valley Intermediate School in Locust Valley, New York, teacher Wendy Fein confirms Perkins' view of the design process through her work with students: "The design process promotes organizational skills and creativity—two seemingly opposite concepts that must coexist in a truly effective learning environment. Creativity without some form of organization can result in chaos....Rapid advances in technology and information demand that students acquire the organized, step-by-step design process that will permit (them) to grow into productive and effective adults, able to succeed in a rapidly changing world....{The design process} is easily transferred to problem solving in any discipline."\*

# Call for Nominations

# Design Guild Award

The Design Guild, a volunteer organization associated to someone who resides/ with the School of Design at NC State University, is soliciting nominations for its 1999 Design Guild Award.

The purpose of the Design Guild Award is to recognize the significant contribution that an individual or group of individuals has made in design in the southeast region of the United States. This award has been created to bring awareness to the importance of design in the community - that it is not something to be taken for granted or overlooked, and that the practice of good design is a sign of good citizenship.

This award is to be given has resided in the southeast region of the United States or whose designs or influences on design have enhanced this area. The social context of the work. as well as the public service of the recipient shall be taken into consideration.

Nominations shall be open for all categories of design, including but not limited to architecture,

arts, graphic design, landscape architecture, urban and regional planning and industrial design.

The recipient need not have attended the School of Design at North Carolina State University.

Submittals can be in any appropriate form which demonstrates qualifications.

Nominations will be accepted until October 15, 1998.

Send nominations to:

# Design Guild Award

c/o School of Design Development Office Box 7701, NC State University Raleigh, NC 27695-7701

IF YOU HAVE QUESTIONS, PLEASE CALL ANN SUNDBERG AT (919) 515-8320.



Kermit Bailey, Associate Professor of Graphic Design, exhibited his work at the Horace Williams Historical Society in Chapel Hill and the NC Central University Alumni Invitational Exhibition in Durham.

Peter Batchelor, Professor of Architecture, received the School of Design Faculty Outreach and Extension Award for 1998 for his work with several Urban Design Assistance Teams, the Triangle J Council of Governments and the Turtle Island Project in Halifax County. Peter organized an Urban Design Assistance Team to work with the town of Thomasville this past March.

Georgia Bizios, Professor of Architecture, taught a course on Design Guidelines at the University of San Simon in Cochabamba, Bolivia. She also edited *Reading Lists and Course Outlines, Volume* 4, published in 1988 by Eno River Press.

Andrew Blauvelt, Department Head of Graphic Design, will take a one year leave from NC State to become Director of Design at the Walker Art Center in Minneapolis, MN. Robert P. Burns (B. Arch. 1957), Professor of Architecture, has been awarded the Phi Kappa Phi National Artist Award for the 1998–2001 Triennium. He was selected for the honor from more than 275 nominees nationwide. Phi Kappa Phi is among the world's largest and most prestigious honor societies, recognizing excellence in all academic fields. The society established the artist award in 1983 to honor its members for outstanding achievement in the arts.

Roger Clark, Professor of Architecture, has been named an ACSA Distinguished Professor by the Association of Collegiate Schools of Architecture. This prestigious award is given for sustained achievement in the advancement of architectural education through teaching design, scholarship, research or service. Roger's citation read, "Former students note the inspirational value of Clark's ability to expose the connection between the relatively abstract ideas he promotes and their physical manifestation." Roger also was awarded the School of Design Board of Governor's Award for 1998, which honors teaching at the colleges and universities in the UNC system.

Meredith Davis, Professor of Graphic Design, published the book *Design as a Catalyst for Learning*. She participated in design critiques and juries at the University of Buenos Aires, Rhode Island School of Design and the American Center for Design Student Conference, and served as a juror for the IDSA annual competition. She also presented lectures at Hofstra University, ICOGRADA Congress in Uruguay, the University of the Arts, and the AIGA Student Conference.

Lope Max Diaz, Professor of Design & Technology, exhibited his work as part of a group show at the Galeria Botello in San Juan, PR. Lope has been appointed to a two-year term of the City of Raleigh Arts Commission and serves on the City Art Grants Committee and the art Acquisition and Public Display Committee.

Patrick FitzGerald published several articles about the Intellimedia Initiative, a cross-disciplinary research effort, on which he has collaborated with Professor James C. Lester of the Computer Science department.

Frank Harmon, Associate Professor of Architecture, has been elected to the College of Fellows of the American Institute of Architects.

Bryan Laffitte, (MPD 1986) Associate Professor of Design & Technology, was named to the Academy of Outstanding Teachers at NC State University.

Robin Moore, Professor of Landscape Architecture, received the School of Design Faculty Research Award for 1998 for his long-term work in Childhood and Environmental Quality, specifically his field research for the Growing Up in Cities project. **Dr. J. Wayne Place**, (M.Arch. 1975) Professor of Architecture, was the School of Design's nominee for the Alumni Distinguished Undergraduate Professorship for 1998.

J. Patrick Rand. Associate Professor of Architecture, was a reviewer of papers submitted to the ACSA Annual Meeting/ Technology Conference in Cleveland, OH in March 1998. He moderated the session on "Pedagogy, Judgment and Typology: The Technology Sequence at the University of Pennsylvania." In addition, Pat presented four invited papers at the annual University Professor's Masonry Workshop, which took place at the Georgia Institute of Technology in March. He was the only architecture faculty member in the country invited to present at this conference. Pat has been promoted to Professor of Architecture.

Fatih Rifki, Department Head of Architecture, received his Ph.D. from the Department of City and Regional Planning at UNC-Chapel Hill in May.

Henry Sanoff, Professor of Architecture, has been appointed to the National Advisory Board of the National Clearinghouse for Educational Facilities, which provides information on all facets of the design, construction and maintenance of elementary and secondary school facilities. He will be a featured speaker this summer at a conference on Integrating Educational Facilities Across Borders, sponsored by the AIA Committee on Architecture for Education in conjunction with the Society for College and University Planning.

Martha Scotford's book, Cipe Pineles: A Life of Design is forth-coming from W.W. Norton & Company this summer. Martha is Professor of Graphic Design and Associate Dean for Graduate Studies, Research, Outreach and Extension.

Joani Spadaro, Associate Professor of Graphic Design, will become Acting Head of the Graphic Design department beginning in August 1998.

Paul Tesar, Professor of Architecture, conducted a workshop on design theory for Haworth Industries, Holland, MI and co-organized the NC State University symposium "Making Things Well" and gave a presentation on "The Maker's Freedom and its Uses."

Scott Townsend has been promoted to Associate Professor of Graphic Design. He conducted a workshop in digital imaging and multimedia at Wake Forest University and lectured at the International Information Design Conference, "Visions Plus 3" in Austria.

Larry Trachtman, Executive Director, Center for Universal Design, has received the 1998 Distinguished Service Award from the Rehabilitation Engineering and Assistive Technology Society of North America.



Joseph Dixon III (B. Arch. 1965) recieved a 1998 Arthur Ross Award from Classical America for residential design. Classical America is the society founded to encourage the classical tradition in the arts. The Arthur Ross Awards honor those men and women who have continued to sustain that tradition.

Renee Lamm Esordi (BEDV 1989) reports from San Diego that she and her husband Mike have begun a design company called "duotribe". Renee has also begun a photography business and has been showing her fine art photography in small galleries. She hopes to hit the LA gallery scene one day soon.

Randy Hester (BLA 1968), Professor of Landscape Architecture at UC-Berkelev. has been named the School of Design's Distinguished Alumnus for 1998.

Joyce W. King, formerly Joyce W. Baker, (BEDP 1979, MS Management 1984) has won two national awards for Job Site Supervisor, a bi-monthly construction newsletter published by FMI Corporation. The newsletter won a prestigious Clarion Award from the Association of Women in Communications for Best Newsletter produced by a for-profit firm for an external audience. The publication also won First Place out of 330 entries in the Newsletter Category from the Society for Marketing Professional Services. Joyce also recently exhibited her paintings at the NC Academy of Trial Lawyers in Raleigh.

John S. Langdon (BEDA 1982, BAR 1983) has joined FreemanWhite in Charlotte, NC as an associate and project architect for the Senior Living Studio.

S. Jeanne LeFever (M.Arch. 1988) has been promoted to Associate and Head of Architectural Services at the Glave Firm in Richmond, VA. Recent projects include the Moravian Archival Facility in Old Salem, NC and renovation at The Homestead resort in Hot Springs, VA.

A Respose biopsy forceps designed by Monty Montague (BEDP 1980), Design Principal of BOLT in Charlotte, NC and Mark Gildersleeve (BEDI 1992) was recently acquired by the Chicago Athenaeum Museum of Architecture and Design for its permanent collection. In addition. the VAC Visionary Stereo System designed by Monty and Chris Yongue (MSID 1994) was awarded an Innovation Design Award at the Consumer Electronics Show in Las Vegas in January 1998.

T. Mark Paullin (BEDA 1980) is now a principal at the newly renamed architecture firm of Meyer Greeson Paullin in Charlotte, NC.

#### IN MEMORIAM

Kenneth M. Sangster (BLA 1964) died on April 12, 1998 in Chapel Hill. While a student, he received the Tivoli Gardens Prize which enabled him to study in Europe for a semester. During his career, he was associated with landscape architectural firms in North Carolina, Virginia and Florida and in his own private practice in Raleigh, as well as in the Durham planning department. Memorial contributions may be made to the Landscape Architecture Fund for Excellence, c/o School of Design. Box 7701, Raleigh, NC 27695.



PHOTO BY EDWIN MORGAN @1998



Tony Brock, (Master's student, Graphic Design) designed the document commemorating cultural critic bell hook's 1997 Harwell Hamilton Harris lecture. This project received a Third Place Medal in the third annual student competition sponsored by the Society of Publication Designers. The work of Tony and David Kasparek, (Master's student, Graphic Design) will be featured in Typographics 3, to be published by Hearst Books International in the fall.

**Susan Curtis**, (Master's student, Graphic Design) will have an essay published in the AIGA Journal devoted to new media.

A portable grill made of heat-resistant fabric designed by **Bartosz Korec** (Junior, Industrial Design) was featured in the the March/ April 1998 issue of *Fabrics & Architecture*. The grill provides a 16x16 grilling surface 30 inches off the ground, its heat-reflective fabric cools down rapidly and it can be rolled to fit a 4.5 x 16 inch stuff bag for easy transport and storage.

Conrad Langley, (Master's student, Landscape Architecture) received a Fullbright Fellowship to pursue his MLA final project in Iceland. He will be exploring greenways as a key element in environmental education.

Teresa London (Senior, Art and Design) received an honorable mention in the Virginia Jackson Design Award competition sponsored by the International Textile Market Association. Her design will be displayed at the ITMA's Summer Showtime in High Point.

Sid Moye (Master's student, Industrial Design) took first place in the "Best Special Effects" category of the annual International Student Competition sponsored by Alias/Wavefront. Sid's entry was an animation that he produced last semester focusing on 3D animation and modeling for visual effects. He will receive a \$1,000 cash prize and a trophy at the Siggraph Convention in Orlando, FL and will compete for the grand prize.

Mary Woltz, (Master's student, Landscape Architecture) received the Sigma Alpha Lambda National Scholarship. This is the fifth consecutive year that an NC State student received this landscape architecture honor society's single annual recognition.

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