



## Theme 4: People and Ideas in the Assessment of Public Built Environments

### Universities, City Hall, Industries, And People The Motor For Transforming Cities Into Sustainable Cities.

**Workshop Chair: Lacomba, Ruth (Solar Architecture Workshop, Mexico City, Mexico).**

We are studying the Cities of Davis, California, USA; Bellaterra, Barcelona, Spain; and Chetumal, Quintana Roo, Mexico. Our main objective is to research how can we transform normal cities into environmentally friendly cities. In studying the three cases, we hope to detect guidelines that can be applied to other cases. For the workshop we count with the help of Beatriz Rodriguez, from Universidad Veracruzana, a coauthor, and probably with the help of coauthors Esperanza Garcia, from Metropolitan University of Mexico City and Inocente Bojorguez from University of Quintana Roo. In this article we are analyzing the case of Davis, California. The city of Davis has several characteristics that caught our attention. According to the planners of the City Hall of Davis (1) green belts, (2) bike paths, (2) wall fence and planting guidelines, (4) several community parks, (5) community orchards and green houses, (6) environmentally friendly and energy efficient homes, (7) noise barriers, (8) a hot line to denounce, detect and remove graffiti, (9) an efficient bus line to connect people, bikes, and buildings, (10) city planning and buildings designed to help people with physical disabilities. Thanks to the efforts of the City Hall, the University and the inhabitants, the city remains a placid green island of lower temperature, less noise and no pollution compared to the neighbor city of Sacramento. According to S. Yannas, the following considerations should be considered when designing urban space: (1) built form density and types to influence air flow view of sun and sky, (2) street canyon width to height ratio, and orientation to influence warming up and cooling processes, thermal and visual comfort conditions, (3) building design to influence heat gain and losses albedo and thermal capacities of external surfaces, (4) vegetation and bodies of water to influence evaporation and evaporative

cooling processes on building surfaces and or open spaces, (5) traffic reduction, diversion, rerouting to reduce air, noise pollution, and heat discharges.

### Public Buildings

**Creating Questions About Designing Exhibit Space: Translating A Science Center's Ideology Into Meaningful Learning Space For Visitors. Gobes-Ryan, Sheila, Graham-Kim, Nancy, Bagwell, Tyler and Moreman, Shane (University of South Florida, FL).**

This project explores the ways that a particular core ideology (of a science center) might or might not be reflected in its design. The Museum of Science and Industry in Tampa, Florida has defined its ideology as "Making a difference in peoples' lives by making science real". How can an organization successfully translate a written core ideology into their design process for a physical learning environment? How does the ideology of the organization translate into an interactive learning experience within the space? Finally, how do you determine the success of these translations as exhibit space? Methods of gathering data will include an interactive workshop comprised of creators and utilizers, observation, ethnography, and conversational interviews. These methods, by incorporating a range of user perspectives, will facilitate conversations that attempt to increase understanding and evaluating the contextual relationship between the designed environment and ways of learning in a science center.

### Experiencing The Getty.

**Augustin, Sally (Haworth, MI), and Wise, James (Eco-Integrations, WA).**

The Getty Center, designed by Richard Meier, is both a museum and a gathering place for residents of Los Angeles County and visitors to the area. While it is world famous for its neo-Modernist architecture, how well does such a design translate into a fulfilling visitor experience? This paper uses a macro-level human factors audit of the Getty Center to analyze the experience of visiting the Getty, and also applies some prin-

ciples of environmental and evolutionary psychology to help explain the observed effects of the surroundings. The human factors audit of the Getty Center was used to build a hierarchical assessment of the museum's design and focused on issues such as wayfinding, acoustics, lighting, pedestrian movements of visitors, and the sensory aesthetics of the facility. The audit revealed that human factor concerns apparently had been considered in the design of the building and that appropriate retrofits and improved visitor experience of the Getty environment. From an environmental and evolutionary psychology perspective, the design of the Getty creates rich sensory experiences that in many ways recreate the positive landscape experiences of our ancestors on the African savannas. For example, the bright natural light with its intersecting view lines around the site illuminates and connects restorative natural vistas and fountains. It is hypothesized that people have a pleasant experience overall when visiting the Getty, although individual features of the environment may be stress inducing due to glare at certain times of the day and crowding. Visitors' experiences are improved through easy access to natural views and materials as well as their ability to observe other individuals relaxing in natural environments or other congregation areas which provide high degrees of personal control over the furniture. There are ample opportunities for prospect and refuge at the Getty, and it becomes a successful multipurpose kind of community facility rather than just another art museum.

### **Diana, Elvis and John: Connecting Popular Culture & Place In The House museum.**

***Mohr, Cynthia (The University of Memphis, TN).***

Diana, Elvis, & John: Analysis of the relationship between popular museum. Five aspects of place and popular culture: Setting, Context, Taste, Feeling, and Association provide the framework for case study evaluation. By definition, a museum is a collection. A historic house museum may be notable for its collection(s), structure, and/or owner. The three historic houses in this study have elements of all three. V. Sackville-West made reference in *The English Country House*: "Museums? A museum is a dead thing; a house which is still a home of men and women is a living thing which has not lost its soul." The draw of these houses is uniquely related to their owner/residents, the development of popular culture and the subsequent effect upon our sense of place.

### **Conceptual Development of an Approach to Assess the physical Environment's Interrelationships in the Functioning of Correctional Settings: Experiences of a Researcher New to the Field.**

***Lulham, Rohan (PhD Student, Sydney University, Australia).***

The paper is a discussion of the conceptual development of a new researcher to the study of the Physical Environment's interrelationships with the functioning of correctional settings. Central to the discussion is the notion of 'ecological validity' in Environment Behaviour Research, and its relevance to the development of valid design recommendations. The literature on correctional institutions was reviewed and a number of important concepts identified from the research. The incorporation of these concepts into research on correctional institutions was proposed as essential to establish ecological validity. A number of prominent theoretical approaches, including the approaches of Altman and Roggoff (1987), Wapner (1995) and Magnusson and Stattin (1996), were evaluated for the degree to which they incorporated these concepts. Research methods and analysis in the EB field, and broader fields, were discussed with relevance to these concepts. The paper concludes with some questions about the relevance of ecological validity to Environment Behaviour Research. Whether ecological validity is an achievable goal, and the implications for the field as a whole if ecological validity is not achievable.

### **Shopping Environments - Old And New.**

***Ng, Cheuk Fan (Athabasca University, Alberta, Canada).***

In many cities in North America, shopping centers, large and small, have replaced the traditional on-the-street shopping and open markets. In this paper, the results of a literature review of environment-behavior research on shopping the old way (i.e., on-the-street shopping and open markets) and shopping the new way (i.e., shopping centers and, possibly, on-line shopping) are presented. The focus of analysis is on comparing behavior in these shopping facilities, e.g., buying and selling, social interaction, widow-shopping, and physical exercise in relation to the environmental features of these facilities, e.g., layout, location, and lighting. Any implications for environmental design are discussed.

# Workplace Performance and Productivity

## Impact Of The Physical Environment On Knowledge Worker Performance.

*Augustin, Sally (Haworth, MI).*

The impact of a major modification of the physical work environment on the attitudes, behaviors, and productivity of a group of knowledge workers was studied in situ at an advertising agency using a combination of quantitative and qualitative measures. Physical spaces known as “team rooms” were built for pairs of creative and management teams working together to develop advertisements for particular brands. Data were gathered via behavioral observations, interviews, and written surveys. These data indicated that the new physical environments encouraged workers to interact more extensively in creative problem solving sessions, facilitated the generation of cognitive artifacts to support innovative processes, and streamlined the mechanical activities required to conduct problem solving sessions. The efficacy of collaborative work was increased. Workers felt that the quality of their own work improved after the described modifications were made to the work environment. Work processes were also perceived to flow more smoothly after the environmental redesign than before any changes to the physical environment were enacted.

## Making And Managing The Physical Environment For Creative Teamwork.

*McCoy, Janetta, Arizona State University, AZ*

On-going investigations of office work environments suggest that highly creative teams have unique, distinctive physical requirements and that the physical work environment of a team is part of a system integral to its creative achievement. Building on an earlier exploratory investigation comparing highly creative and less creative teams in a government agency, subsequent studies in private corporations provide useful information for designers and managers of work environments for creative teams. These studies indicate that physical features of an office setting support creativity when: 1.) teams choose to exercise control over acquisition of physical requirements; 2.) teams have ready access to features that provide functional opportunities for communication and collaboration; and 3.) non verbal self expressions of the team focus provide feedback for future activities. Alternately, these studies indicate physical features of a work environment may inhibit creative achievement by discouraging autonomous behavior; by limiting opportunities

for communication and collaboration, and by discouraging self-expressions of team identity. A theoretical framework linking creative teamwork and the physical work environment is proposed.

## An Integrated Design Approach to Improve Performance and Productivity of Workspaces in Egyptian Office Buildings.

*El-Halafawi, Amr (Cairo University, Egypt) and Soliman, Mona Hassan (Misr International University).*

The importance of a high quality workspace has never been more evident than in today’s climate of rising real estate costs and increasing business competition. To attract and retain high-caliber employees, an organization must be able to offer a safe, comfortable, and stimulating work environment. To support those employees in executing their responsibilities and to maximize their contribution to the organization, the workspace must fulfill their functional, environmental, and psychological needs. The paper discusses the interrelationship between human behavior and the built environment. It proposes a design model that determines different value weights for the interrelationships between functional, environmental, and psychological performance of workspaces’ components, ambient conditions, and psychological constructs in Egyptian office buildings. Also, it specifies different space components, ambient conditions, and psychological constructs dominating critical design decisions and workspace planning. The proposed design model is generated as a result of locally evaluating and testing the generic conclusions based on recent literature reviews discussing the international experience in what concerns the interrelationships between functional, environmental, and psychological performance of the workspace. The proposed design model can be used as guide for architects while designing and evaluating their planned workspaces in Egyptian office buildings.

## Standing Improves Sleep. Why is poor sleep so common?

*Roberts, Seth, University of California at Berkeley, CA*

One reason, data described in this presentation suggests, is that many jobs - for example, office jobs - require sitting most of the time. The data come from two sources: (a) Self-observation. By accident, I discovered that when I stood much more, my sleep improved. Self-experimentation supported this conclusion. (b) A survey. Comparison of store clerks (who stand most of the time) and workers who sit most of the time supported the conclusions from self-experimentation. The sleep of workers who sat most of the time got worse as they got older. The sleep of workers

who stood most of the time remained good with increasing age. If these findings turn out to be widely true, workplaces should be designed to allow most work to be done standing up.

### **An EB Framework Of Privacy Regulation For Workforce Training And Development.**

***Kupritz, Virginia, The University of Tennessee-Knoxville, Tennessee***

The study presents a conceptual model of privacy regulation operating in the workplace through environmental, behavioral, and social mechanisms. The study synthesizes scattered Environment and Behavior (EB) research on privacy for workforce training and development. The application of EB theory and research on privacy to Human Resource Development (HRD) needs allows the HRD discipline to understand the important connection between privacy and developing human resources. This connection supports HRD initiatives that take into account organizational issues impacting privacy when training is planned, evaluated and developed. The conceptual model represents a first step in providing Human Resource Development (HRD) professionals and organizations with a template they can use systematically to examine the range of privacy issues that may be pertinent to their particular situation. The study also acknowledges that privacy-regulating mechanisms operate within the context of the larger societal culture. Global workers bring to the workplace diverse privacy needs and means to regulate privacy gained through prior cultural learning from their larger societal cultures. The study urges HRD professionals and organizations to train and develop a workforce that is sensitive to the cultural variability of privacy.

### **Application Of Genetic Algorithm In Office Building Configuration - Reproduction Model Simulation In A Japanese Local Government Office.**

***Kato, Akikazu (Toyohashi University of Technology, Aichi, Japan), le Roux, Pieter C. (Toyohashi University of Technology, Aichi, Japan), and Kitakami, Yasuhiro (Kozo Keikaku Kenkyusho, Tokyo, Japan).***

This paper aims to develop a computerized support system using Genetic Algorithm (GA) for office building configuration to implement the organizational restructuring of Japanese local government office buildings. The system would consist a part of the extended CAFM, computer aided facility management, system by presenting a floor-to-floor division configuration on a CAD screen. By this, the system would provide a

common base for the decision-making. Offer a comprehensive tool for facility managers, office planners and designers, and set up a numerical framework for workplace environment researchers.

### **Evaluation Of Intelligent Office Buildings In The Cross-Cultural Context**

***Symposium Chair: Preiser, Wolfgang (University of Cincinnati, Ohio).***

The purpose of this symposium is to report on progress in the International Building Performance Evaluation (IBPE) project. In Phase I of the project, a Universal Toolkit is being developed for data gathering and analysis techniques. This toolkit will have culture-specific modifier modules attached to it, which reflect different countries and cultures, office space allocation, utilization, ambient environment, and other relevant performance criteria. Pilot evaluation projects on intelligent office buildings are being carried out in the participating countries with the purpose of refining the methodology and toolkit, as well as to develop the culture-specific modules further. Eventually, the Universal Toolkit, the case studies, as well as the modules, will form the basis for a book. The symposium will report and debate examples of specific case study evaluations. Participants include: Dr. Ulrich Schramm, Dr. Sheila Ornstein, Dr. Edward Finch, Francoise Szigeti, Dr. Ahuva Windsor, Peter McLennan.

### **Design Review - Another Feedback Loop Of The Integrative Framework For IBPE.**

***Schramm, Ulrich (Munich, Germany).***

The purpose of the presentation is to tell about an ongoing IBPE case study based on the practical experience of an architectural firm. At IAPS 16 in Paris, the very beginning of a new life cycle for the future office building of a car manufacturer in Germany was reported: starting from the results of the post-occupancy evaluation (POE) of the manufacturer's existing office building, state-of-the-art design criteria were developed during the programming phase, leading to the schematic design of the new office building. Now, this paper reports on design review that represents the feedback loop of another of the six phases of the integrative framework for building performance evaluation. The evaluative loop during the design phase involved the architect, the programmer, and representatives both of the client organization and the approval authorities of the city. This evaluative review stance in the early design phase allowed the project participants to con-

sider the effects of design decisions from various perspectives, while it was still not too late to make modifications in the design. The presentation will focus on some major results of the actual design review, leading to basic recommendations for the early phases of the building performance evaluation process.

### **Building Performance Evaluation (BPE): Using The ASTM/ANSI Standards For Whole Building Functionality And Serviceability To Link Requirements To Occupant Satisfaction Surveys.**

**Szigei, Françoise (International Centre for Facilities, Canada), and Davis, Gerald.**

This paper will report on the use of the *ASTM/ANSI standards for Whole Building Functionality and Serviceability* to prepare a rating profile of the Serviceability of a major landmark building in Chicago, and to then link this rating profile to the results from a Customer Satisfaction Survey conducted by the Gallup organization for the building owner (US General Services Administration). The *ASTM/ANSI standards for Whole Building Functionality and Serviceability* provide the tools to capture actionable, customer defined needs, and match them to indicators of capability expressed as ranges of performance on different topics. The standards can also be used to compare the capabilities of several facilities, or the requirements of several groups. Measurement matters: If you can't measure it, you can't manage it. There is a lot to be learned from doing Building Evaluations. But to be useful, Building Evaluations need to be linked to Customer Needs on one hand and Customer Satisfaction on the other, as part of a comprehensive system of measurements. Actionable, customer defined needs have to be captured and matched to indicators of capability.

### **Africa + Office: A Comparative Analysis of Workplace Planning Methodology in South Africa and Japan.**

**Le Roux, Pieter C. and Kato, Akikazu (Toyohashi University of Technology, Toyohashi, Japan).**

The phrases "Africa" and "office" might at first seem to be two complete opposites, but by no means does it imply a functionally inferior workplace environment. However, contemporary workplace planning in South Africa is distinctively different when compared to similar typological design methodologies in developed countries such as Japan. Changes in socio-economic conditions, work and workplace cultures, and the urban context have shaped and developed the office market sector, ranging from the tall skyscrapers of the

late 70's and early 80's, to the contemporary "office park tradition." Through all of this a unique relationship between workplace form and function and building design development has transpired. The purpose of this study is to introduce the culture specific workplace planning methodology in South Africa through a comparative analysis with that of Japan. The study will also focus on building performance issues as measured against South Africa's status as a "developing country," as well as lessons from Japanese workplace planning that can be applied to further improve the quality of South African workplace design.

### **Designing Workplaces For The 21st Century.**

**McLennan, Peter (Bartlett School of Graduate Studies, London).**

The presentation will report on a building evaluation case study of an alternative workplace environment created to improve work performance within an existing building. This workplace uses flexible work settings as a means of supporting changing work activities and improving resource performance, both human and physical. The project was created with the direct involvement of the operational staff in both briefing and design through surveys, focus groups and design workshops. The completed project was evaluated with a multi-method approach that included: staff satisfaction surveys; focus groups; utilization surveys; and space measures. The results of the evaluation suggest that the project achieved the objectives set.

### **The Evolution of Post-Occupancy Evaluation: Toward Building Performance and Universal Design Evaluation**

**Preiser, Wolfgang F. E. (University of Cincinnati, Cincinnati, Ohio).**

The purpose of this paper is to define and provide a rationale for the existence of Building Performance Evaluation (BPE). Its history and evolution from Post-Occupancy Evaluation (POE) over the past 30 years is highlighted. Major methods used in performance evaluations are presented and the estimated cost and benefits described. Training, opportunities and approaches for building performance evaluation are enumerated. Possible opportunities for governmental involvements in building performance evaluation are sketched out. The next step and new paradigm of Universal Design Evaluation (UDE) is outlined. Last but not least, questions and issues regarding the future of building performance evaluation are raised.

### **Life After The Move: Post Occupancy Evaluation**

## **Of A Government Building.**

**Windsor, Ahuva (Consultant, Tel Aviv, Israel).**

The presentation will focus on a POE of a Government building 10 months following occupancy. The preparation and orientation process the organization underwent during the 2 years preceding occupancy of its new building, was presented at the IAPS16 Paris meeting. Since moving into its new home the organization went through an adjustment process, part of which was managed by internal activities such as establishment of a “complaints committee”, to oversee workers’ requests regarding the new building. There were also on-going technical tests to adjust building systems functioning, and space management procedures to improve quality of everyday working life. The POS to be reported here is focused mainly on workers’ satisfaction issues. It was requested by management as a feedback method as well as a way for opening a communication channel with workers. A major issue of interest is that of the open space offices, which had been an issue of concern to workers prior to the move. All 550 staff will be administered the questionnaires by supervisors, who will also collect them. In a previous feedback questionnaire (immediately before occupancy) it was observed that workers like to respond in groups. Thus an additional alternative route for responding was offered to workers, i.e. a group letter to management that would serve to emphasize group or organizational unit perspectives.

## **Assessing Workplaces.**

**Symposium Chair: Zimring, Craig**

### **Perceived Image Of Office Buildings And Their Connotations With Work Patterns.**

**Toker, Umut (North Carolina State University, NC).**

As new work patterns arise, organizations and individuals become more conscious about the image of their office settings. However, research into imageability of offices has mostly been limited to interiors. The purpose of this study was to examine the relationship between *work patterns* and *perception of office buildings’ exteriors*, through obtaining subjective responses of *architects and non-architects*. Understanding whether a difference exists between images attributed to ‘new’ and ‘conventional’ work patterns was a particular objective. A model of relationships between work patterns and image of office buildings’ exteriors was developed. Photographs of office buildings representing six architectural styles were sampled from architectural literature. A self-administered questionnaire was designed. Subject groups of

architects and non-architects evaluated sample office buildings on descriptive scales, expressed their *preferences and perceived connotations* with ‘conventional’ and ‘new’ work patterns. It was observed that ‘high-tech’, ‘neo-modern’, ‘deconstructivist’ styles and particular descriptive properties had connotations with new work patterns. The responses of two subject groups were not significantly different. Overall, the sensitivity of respondents implied that detailed research has to be conducted on exteriors of office buildings based on descriptive scales.

### **Flexible Workplace Alternatives And Situated Cognition.**

**Barnes, Janice (University of Michigan, MI).**

Changes in telecommunications over the last decade have introduced new ways of working into an economy built on traditional business interchanges in the office. One particular arena where this is apparent is in the shift from dedicated workplaces to flexible work alternatives or the ‘boundaryless workplace’. Boundaryless workplaces offer new challenges for employees who work from a variety of locations. These challenges require employer to alter traditional measures such as facetime, to adjust status markers such as corner offices, and to recognize that employees operate within and rely on knowledge structures about the work process. In fact, boundaryless work requires that organizations give voice, and credit, to the knowledge and the process that an individual or a team engages in while completing work. Architectural research has traditionally considered the dedicated workplace as a locus of interactions among employees and the work process, but flexible work alternatives challenge this older model. With changes from a dedicated workplace to a flexible workplace, one fundamental difference in work is the physical setting. However, there has been little work questioning how the physical setting of work actually affects the way that employees share knowledge or situate cognition about the work process. If there is a link between situated condition and physical settings, then it seems important to determine what this link might be, and to carefully consider its architectural ramifications. How does an architect design for boundaryless workplaces? Using the theoretical framework of situated cognition, this paper presents an in-depth case study illustrating the relationship between physical settings and shared knowledge structures in a globally positioned organization. Research findings suggest design criteria specifically geared towards enhancing the effectiveness of individuals or teams sharing knowledge in boundaryless workplaces.

## **The Capturing Of POE Data In Semantic Building Models.**

***Debajyoti, Pati (Georgia Institute of Technology, GA), Fried, Augenbroe (Georgia Institute of Technology), and Zimring, Craig (Georgia Institute of Technology, GA).***

Converting data from Post Occupancy Evaluations (POEs) to usable knowledge is a recurring theme in E&B research. One way to do this would be to incorporate POE data into the electronic building signatures that are being developed for buildings. These signatures are standardized electronic representations of all aspects of a building including form, materials and equipment. The signature created during planning and design stays with a building and becomes a resource for facility management. However, whereas physical “as-built” data have recently gone through substantial consolidation and standardization (through IAI-IFC efforts), data from POEs have proved to be difficult to capture in a unified, comprehensive knowledge base. With little agreement on POE evaluation criteria, methods, tools, or data coding formats, it is difficult to consolidate lessons-learned or develop more general theories of building performance. We are developing a common semantic model for coding all varieties of POE and as-built building descriptions that will allow coding of POEs from different researchers and will permit POE data to be stored in common format with physical “as-built” data. We are developing a system-independent knowledge structure modeling relationships between POE and physical building data in a semantic space that includes meaningful placeholders for abstract POE related concepts. This will be a unified data structure with embedded performance goals and requirements in order to convert data to useful information for design support, facility management and other end uses. We are using ‘issues’ as the concept that objectifies the linkage between subjective data and the building components and their properties that those data relate to. Additional context for these issues is supplied by incorporating performance goals and requirements in the as-built representation.

## **IBPE-Japanese Report: The Analysis of Recent JFMA Benchmarking.**

***Akikazu, Kato (Toyoashi University of Technology, Toyoashi, Japan), Tsunekawa, Kazuhisa and Taniguchi, Gen (Nagoy University, Nagoya, Japan).***

JFMA is taking a leading role to develop a benchmarking for contemporary Japanese office buildings. Our analysis is conducted in light of other activities carried out by the Japanese Facilities Management Association (JFMA), as well as surveys and awards

given by the New Office Promotion Association (NOPA). And, together with our previous reports for the IPBE project, the presentation will outline the building evaluation methodologies and performance criteria developed recently in Japan.

## **Designing Workplaces Around The World – How Does Culture Affect The Process?**

***Intensive Chairs: Smith, Phyl (Working Spaces, CA), and McCoy, PhD., Janetta (College of Architecture and Environmental Psychology, AZ).***

Workers are now able to work more easily all over the globe. If work is becoming more homogenous, what difference does culture make in workplace design? For instance, North America is seen as having the world’s most influential workplace designers but perhaps the most submissive end users of workspaces. European workplaces, on the other hand, emphasize user influences. What happens in other countries? Who decides? What are the results? We will examine the impacts of different cultures on: Edra’s Work Environments Network Intensive session in Edinburgh will examine the impacts of different cultures on: How work environments are planned – for what defined purposes? Who plans them? What information is used? What legal requirements apply? What do they look like? How do they work? How do people feel about them?

## **The Changing Workplace.**

### **A Work Environment for Sandia’s Advanced Concepts Group.**

***Miller, Dwight (Sandia National Labs, NM).***

Project goals were to select a site, design, and build a work environment for a group of 13 innovative principals, support staff, and visiting fellows who will be developing revolutionary solutions to national security issues of the next century. Design goals included developing work-space features that facilitate collaboration, ‘distributed cognition’, and stretching peoples minds to tackle virtually insoluble problems. Literature was consulted on think-tank design and approaches that enable teamwork, creativity, and productivity, and that discourage individualism, entrenchment, and traditionalism. Programming methods included interviewing management and staff and performing site analysis on two highly contrasting facilities. A detailed architectural program summarized successful ‘skunk works’ innovations, suggested Brilliant ‘commons’,

'task-deconstructed' offices, and media that support 'displayed thinking'. A commons design was implemented where the 'kitchen phenomenon' encourages 'en-counter-ing', a centralized teaming space utilizes copious hanging whiteboards, and a futuristic, reconfigurable, high-tech, 'game room' supports teleconferencing, symposia, and teaming. The author is conducting and will report on a post-occupancy evaluation, where usage patterns and user opinions will be used to determine how well the facility supports organizations goals and individual needs.

### **Walking At Work: A Case Study Of Lucent Technologies.**

***Cranz, Galen (University of California, Berkeley, CA).***

Sitting at work for extended periods causes and exacerbates health problems. Walking at work is an alternative that can be evaluated in the context of Lucent Technologies in New Jersey. The building has a peripheral corridor wide enough for 2-4 people to walk abreast. The design eliminated individual offices at the edge of the building partly in response to concerns about equality in an organization with a large number of high status Ph.D.'s, but this paper focuses on the consequences of the distinctive pattern of movement and circulation for productivity, creativity, employee satisfaction, absenteeism, sociability, and health, including back pain. Methods include site visits, direct and photographic observation, interviewing, and questionnaires.

### **Costs And Benefits Of Flexible Workspaces.**

***van der Voordt, Theo JM (Delft University of Technology, The Netherlands).***

Due to the rapid progress in information and communication technology, work becomes more and more independent of time and place. New concepts such as teleworking, satellite offices, hotel-offices, combi-offices, activity-related and non-territorial workplaces are introduced now world-widely. This presentation will give an overview of trends in Dutch office environments, the main motives to apply new concepts and results of post-occupancy evaluations in innovative work environments. Particularly the effects of different office concepts on communication and interaction, privacy, user's satisfaction and costs are reviewed. Research data will be analyzed on differences in experiences of different user groups in relationship to what kind of organization they belong and the type of work. Furthermore we will summarize our findings during the process of implementation. Determinants of success or failure are for instance a clear mission, good communication, user involvement, and taking

into account both rational and emotional points of view. The presentation will be illustrated by examples of office innovation in practice.

## **Working Group For Issues In Facilities Management.**

***Working Group Chair: McCoy, Janetta (Arizona State University, AZ).***

A working group on issues in facilities management will focus on research utilization of Environment and Behavior research by facility planners and managers. This will be a forum for airing difficulties in communication and effectiveness of research application between researchers and managers. Organizers will initiate the discussion with brief discussions of their experiences, including problems encountered and successes achieved. Goals of the session include: 1) an outline of issues that characterize the relationship between E & B researchers and facility managers; 2) the development of an on-going dialogue between research and facility management; 3) identification of a network of researchers and facility managers available for the support and implementation of relevant research. Participants will include:

***Jeffrey Lackney, Ph.D. (University of Wisconsin-Madison),***

***Beth Harmon-Vaughan (Director of Interiors at HOK Sports, London, Melbourne, Kansas City)***

***Dwight Miller, Ph.D. (Sandia Labs, NM).***

## **Community Participation**

***Working Group Chair: Ganis, Mary and Crawford, Pat***

### **The Dilemma Of Community Participatory Planning: Rationalizing Endorsements Of The Planning Concept With Objections To Its Implementation.**

***Ganis, Mary (Maroochy Shire Council, Australia), and Amedeo, Douglas (University of Nebraska, Lincoln, NE).***

Some planning organizations invite members of the community to participate directly in the planning process. The idea behind this is to elicit as many experience-based inputs about community environmental issues and development problems as possible. Such inputs, when blended with planning expertise, significantly assist in the codification of a community strategic plan, in that they tend to expose issues not apparent to planners and reveal community differences about long-term development goals. Presumably, they help rationalize a community's planning objectives into an

overall strategy and, thereby, facilitate the plan's timely execution. Yet, community participation in the planning process may not always be facilitative, especially if participation is, then, followed by objections to the plan's execution. Active participation throughout a plan's development may suggest community endorsement while objections to the plan's execution may suggest rejection. Under what circumstances can a plan both be endorsed and rejected at the same time by a community? The purpose of this work group is to discuss the development of a general model that could account for such an apparent contradiction, in whatever planning context it might have occurred. The model would relate such notions as goal differences between the social self and the private self, perceptions of threats to place-attachment at different levels of place, and, in general, reactions to environmental change. In an effort to tentatively assess the proposed model's plausibility, a case-study community, for which a strategic plan was developed and an apparent contradiction encountered, will be also be evaluated. The session will present a "work in progress" with the aim of gaining feedback to the initial results from the case study research. The participants will be Dr. Mary Ganis (Maroochy Shire Council, Australia) and Prof. Douglas Amedeo (University of Nebraska, USA).

### **The Bayanihan Spirit: Community Participation In Philippine Housing.**

***De Guzman, Maria Carina D. (University of Tsukuba, Japan).***

Residential architecture in the Philippines has been characterized by the single detached dwelling as illustrated by the vernacular "bahay kubo", the Spanish period "Antillan house" and the latter American period homes. Recently, however, multifamily housing is starting to become the representative type of dwelling especially in the urban areas. A survey was made on a multifamily housing project with open-planned units and the development made by the occupants was compared to that of historical prototypes. 50 housing units were chosen from a medium-rise building complex which provided 19.50 sqm. units. The results showed that not only did the plans of these contemporary dwellings compare to their historical counterparts, the use of the bayanihan method - a traditional Filipino custom that means working together especially during house construction or house moving - was also applied. Lofts to be used as sleeping areas of the families were built with the help of neighbors and friends in the housing complex. This community participation activity is contended to be consequential in the effective development of Philippine mass housing.

### **Tartan And Plaid: Weaving Planning And Community Participation.**

***Crawford, Pat (Arizona State University, AZ), and Yabes, Ruth (Arizona State University, AZ).***

The planning discipline has excelled in addressing social barriers to community participation while the design discipline has excelled in addressing physical barriers to participation. The workshop objectives include information sharing between disciplines around the topic of participation practices in community planning and public policy development as well as hands-on experience with participatory techniques. The workshop uses brainstorming and affinity diagramming techniques to generate lists of opportunities and barriers to participation from European and North American perspectives. The findings will be combined with information gathered using the same techniques in a proposed pre-conference intensive workshop focusing on work place design and participation practices. The expected result is a cross-disciplinary enriched understanding of the physical and social barriers to participation. The group dialogues and information gathered expand our understanding of participatory practices and promote the weaving of a common language for further discourse across planning and design disciplines. Exchanging information sources about participatory practices and research will be encouraged and a participation reference guide relating to encouraging diversity in planning issues will be shared with the group participants.

### **Defining Community Design By Delphi Network Analysis.**

***Toker, Zeynep (North Carolina State University, Raleigh, NC).***

A study is conducted to redefine the boundaries of community design by identifying the most influential people who are the key influences in the field. The objective is to obtain a consensus regarding priorities about the issue leaders for currently practicing design and planning professionals. Discovering how to make it possible for people to be involved in shaping and managing their environment is what the community design movement has been exploring over the past few decades. However, the community of design and planning professionals in community design field is a non-place community. Thus, in order to define the field by identifying the key influences, the Delphi Technique will provide information from participants independent of their location. Delphi is a tool for achieving consensus of informed opinion. Community design center directories, related conference attendance lists provide the representative of active practitioners in

community design field. Therefore, respondents of Delphi Network Analysis are selected from a list of currently practicing design and planning professionals in community design field. Results are expected to clarify the social network among these professionals in relation to practitioners' definitions of community design.

## **Participation: A Discussion.**

***Klein, Stephan Marc (Pratt Institute, NY), Paxson, Lynn (Iowa State University, IA), and Francis, Mark (University of California at Davis, CA).***

The session organizers will be joined by several current members of the Participation Network as discussants who will bring their ongoing work to bear on the discussion. This Participation Network sponsored working group will explore participation in design, research, planning, construction and managing environments. Five years have passed since the last network sponsored EDRA sessions at Montreal, which looked critically at the 30+ years of history of participation, considered emerging cultural contexts, and attempted to envision potential futures for it. In this round-table discussion we will look at what has happened since then. We will launch the discussion by outlining a history of participation at EDRA and raising issues including: differences in current normative assumptions from those shaping earlier participation, impact of changing cultures, professional included, on definitions and practices of participation, what the New World and the Old can learn from each other about participation, the impact of these last few years on traditional participation issues-its benefits, determining "good" from "bad" participation, importance of use participation for creating successful environments, difficulties in employing participation techniques, relationship of user participation to creating a truly democratic participatory society, participation's relation to power, control, empowerment, and environmental justice, differences in "top-down" and "grass-roots" participation. This discussion will re-envision participation, reinvigorating it as an important EDRA concern.

## **Participatory Design: When Research And Programming Can Improve Design Quality.**

***Romice, Ombretta, University of Strathclyde, Glasgow UK***

This paper constitutes a mediation on Romice's Doctoral thesis (2000a), which investigated programs for the participation of community groups in design based on the principles of visual literacy and environmental evaluation. Environment-behavior studies can improve the design process and should therefore become part

of it; the question is how. The way proposed is that of participatory management of design where user and designer groups are actively involved in environmental analysis, goals definition, programming, their commitments and roles, carrying out constant checks on the actions taken and, when possible, evaluating the outcomes of the design process. To carry out these activities, the design process must incorporate the information obtainable through environment-behavior studies, and such information derived from the direct study of participants' perception of space. This follows Sanoff's idea of linking design research to participation (1991). Environmental research is extremely well developed and offers considerable resources. The paper proposes a way to organize such a richness, by programming design actions on the base of the systematic research into the perception, use, evaluation and acceptance of the design product.

## **Engaging the Community.**

***K. M. Williamson (University of California, Irvine), Kris Day (University of California, Irvine), Shari Mitchell (University of California, Irvine); Vivian Romero (University of California, Irvine), McMillan, Tracy***

This workshop will explore the physical and organizational aspects of community environments that can engage people socially. City centers, public art, pedestrian pathways, meeting places, and neighborhood associations will be discussed in both European and US settings. The objectives are to: 1) present how each of these elements is supportive of formal and informal social interaction; 2) illustrate how these elements are absent in many of the communities being developed today; and 3) discuss whether and how these elements should be integrated into new and existing developments. By the end of the workshop, we expect that both the audience and the presenters will have increased awareness of the physical and organizational aspects of a community that can bring people together or keep them apart. Attendees will come away with practical ideas on how to modify communities in order to integrate some of the aspects discussed. Audience participation will occur through community visioning sessions.

## **Participation and Programming**

### **Research Based Design: Participatory Programming For The Cap School At The Federal University Of Rio De Janeiro.**

***Rio, Vincente del (Federal University of Rio de Janeiro), Iwata, Nara (Federal University of Rio de***

**Janeiro), and Sanoff, Henry (North Carolina State University).**

The adoption of participatory methods in the programming design and evaluation of the built environment is of importance to the development of the architectural profession, and for the creation of buildings more responsive to the needs of users. This paper discusses the experience gained in a participatory design workshop at PROARQ - the Graduate Program in Architecture of the Federal University of Rio de Janeiro. The case study - a design intervention strategy in a school managed by the Federal University of Rio de Janeiro for rehabilitating the existing building or relocating the building to a new site - permitted a participatory process in which teachers, parents, students, and staff contributed effectively to the quality of the final proposals. Teachers rated their school environment according to such factors as physical features, outdoor areas, visual appearance, learning environments, social areas, and safety. Results from the rating scales were used in a workshop with teachers and parents to develop a program and alternative spatial arrangements. Participatory design methods in shaping the school environment were explored, not only for their effectiveness in building evaluation and programming, but also for their contribution to the creative design process.

**Building From The Inside Out: Participatory Programming In The Design Of The New Eugene Public Library.**

**Venne, Bridget (University of Oregon, OR).**

Although support for participatory design continues to increase, stakeholders rarely apply this practice to civic buildings due to the difficulties inherent in incorporating the contributions from many stakeholder constituencies. Participatory programming, the use of a participatory process throughout the programming and design phases, offers the opportunity to combine the organization and research focus of programming with participatory design's emphasis on consensus and citizen interaction. The new Eugene (Oregon) Public Library's "Building From the Inside Out" participatory process attempted to involve library staff and community members in its programming phase. An investigation of this phase based on information collected in "Designing From the Inside Out: A Case Study of Citizen Participation in the Design of the Eugene Public Library" (Venne, B. Unpublished undergraduate thesis, University of Oregon, Eugene. 2000.) shows that, while not entirely participatory, this phase presents a rough sketch of future citizen involvement in the programming of a large civic building project. An

examination of the "Building From the Inside Out" process shows the potential of citizen involvement in programming as well as design.

**Expanding Web-Based Map-Survey Applications For Community Participation.**

**Al-Kodmany, Kheir (University of Illinois at Chicago, IL).**

As the Internet continues to reshape how the public communicates, planners have the opportunity to use Web-based technologies to widen access to decision making in community planning and design. This paper describes an interactive web-based survey tool that was used to advance a community planning process in the Chicago area. The project involved collaboration between researchers at the University of Illinois at Chicago and leaders and residents of Pilsen, a nearby community. The team used a process taken from the work of Jack Nasar (*The Evaluative Image of the City*, 1998) who developed a method of surveying residents to determine which areas they like and dislike in their community, with the goal of creating a single "evaluative image" of the community that could guide future design and development. Researchers employed a Web-based interactive map that was linked through a server to a GIS program, rather than the traditional phone survey used by Nasar. This project builds upon an earlier version of the survey in which the map was limited to only one section of the community. In increasing the complexity and coverage area of the survey, we were able to develop a more comprehensive understanding of community residents' evaluative image of the whole community. The paper ends with a discussion of the obstacles and future implications of using the WWW to further public participation in planning.

**Visualization Tools And Methods For Participatory Planning And Design.**

**Kheir, Al-Kodmany. (University of Illinois at Chicago).**

Advocates of participatory planning and design have long realized the benefits of visualization tools. Advances in computer technology have provided community planners and designers with an ever-evolving cache of tools to organize and present data to the public. As these new computerized tools become more sophisticated and user friendly, planning professionals must make sense of these tools and decide which ones can best be used to enhance participatory planning and design. This review is meant to provide a general map for planners as they navigate through the multitude of options that currently exist for visualization in public participation planning, assisting them to make an informed choice based on their needs and their

resources. We review and evaluate a wide range of traditional and computerized visualization tools for enhancing public participation in planning; from pencil and paper and physical models to computerized tools such as Geographic Information Systems, Virtual Reality, and computer simulations of the urban environment. We conclude that high tech tools lack the interactivity that traditional tools offer and recommend the integration of both types of tools in any community planning process.

## **Participatory Planning At The Regional Level: The Experience of Chattanooga, Tennessee and Central Virginia.**

**Workshop Chairs: Barnes, Rick (Randolph-Macon Woman's College, VA), and Bennett, Barbara (Central Virginia Regional Renaissance, VA).**

This workshop focuses on an example of participatory planning at the regional scale. Central Virginia Regional Renaissance (CVRR) was a grassroots regional visioning and planning process in which residents identified and prioritized objectives and projects to maintain and enhance the quality of life in Central Virginia. Modeled after a similar initiative in Chattanooga, Tennessee, CVRR was a partnership between planning organizations, governmental and educational bodies, and regional businesses. Residents were invited to several public brainstorming meetings on the future of the region. Ideas that emerged from these sessions were organized into categories and submitted to the residents for a vote. Results then were fed back to government, business, and non-profit organizations for further refinement and implementation. During this workshop the presenters will describe both the Chattanooga and CVRR processes, and will discuss lessons learned. Following the presentation, workshop participants will be invited to compare experiences in large-scale participatory planning. Presenters include:

**Ken Schwartz (University of Virginia, VA)  
Geri Spring (Independent Consultant, TN).**

## **Organizationally-responsive building performance evaluation.**

**Workshop Chairs: Schermer, Brian (University of Wisconsin, Milwaukee) and Zimring, Craig (Georgia Institute of Technology).**

Despite some well-publicized successful examples, building performance evaluation has yet to become

widely incorporated as an integral part of design and construction by large organizations. There are a number of technical, structural and cultural impediments to the routine use of evaluation: few organizations have devoted resources to consolidating, analyzing, disseminating and maintaining lessons-learned; evaluation often threatens traditional departmental barriers; there are seldom individual incentives to participate in evaluations or use results; and, few organizations have developed cultures that embrace experimentation or accountability. Perhaps most significantly, evaluators have not often been successful in linking evaluation to the core values and competencies of client organizations. The participants in this session have performed technical and user-needs evaluation from a wide variety of public and private organizations. Bordass and Leaman are collaborating with others on the innovative PROBE evaluation program, which incorporates both standardized user-needs surveys and assessment of energy and other technical aspects of building performance. Together with Cassels, they also apply the results in advice to clients. Farbsteing has conducted evaluation for many large organizations including the US Postal Service. Rosenheck served POE coordinator for the Office of Foreign Buildings Operations of the US Department of State. Schermer recently completed a multi-year investigation of design, construction and facilities management by a major auto company. Symes is participating in the IANUS Consortium, a European effort linking building evaluation to the provision of public services. Zimring has just completed an international review of evaluation. In the first session, the panelists will present brief case studies and position papers that consider the culture, processes, and core competencies of organizations that are actual or potential clients for evaluation. In the second session, the workshop panelists and participants will consider how building evaluation might be re-conceptualized to be more readily applied by client organizations and their consultants. Presenters:

**Bordass, Bill (William Bordass Associated, London),  
Cassels, Same (ISG Consult, London),  
Farbstein, Jay (Jay Farbstein & Assoc., California),  
Leaman, Adrian (Building Use Studies, Ltd., London),  
Rosenheck, Thierry (US Department of State,  
Washington, D.C.),  
Schermer, Brian (University of Wisconsin, Milwaukee),  
Symes, Martin, (University of the West of England),  
Zimring, Craig (Georgia Institute of Technology,  
Atlanta).**

## **Integrating improved work environments and sustainability into the design process for public buildings.**

***Chair: Carmody, John (University of Minnesota, Minnesota);***

The purpose of this workshop is to discuss the integration of work environment issues and sustainability to create a more holistic design process for public buildings. The workshop will include case studies from ongoing projects aimed at improving the entire building delivery process for public agencies. The focus will be on including participatory programming and client education to achieve better designed, healthier, and more sustainable buildings. Examples used will be: proposed facilities for Minnesota Departments of Health, Human Services and Agriculture as well as area offices for the Minnesota Department of Natural Resources. In the workshop, representatives of state agencies, consultants and university researchers will provide their perspectives on this evolving holistic approach. Audience members will learn about the process through case studies and will be invited to discuss ideas and solutions towards improving the programming and design processes.

***Adams, Graham (Adams Group, North Carolina);***

***Carmody, John (University of Minnesota, Minnesota);***

***Chapman, Wes (Department of Administration, Minnesota)***

***Lunning, Bob (Hokanson, Lunning & Wende, Minnesota)***

***Robinson, Julia (University of Minnesota, Minnesota)***

***Singh, Virajita (University of Minnesota, Minnesota)***

***Wallace, Mark (Department of Natural Resources, Minnesota)***

***Wise, James***

## **Theme 4 Posters**

### **Participatory Process And Bureaucratic Constraints: Undergraduate Landscape Design Projects.**

***Huse, Donna (University of Massachusetts Dartmouth, MA), and Sears, James (University of Massachusetts Dartmouth, MA).***

This presentation of a five-year campus landscaping project focuses on issues of undergraduate student participation in designing and planting sites within the landscape of their 750-acre university campus as part of curriculum-based, community service learning. The

appearance of this campus and its collective self-image have been positively transformed by significant landscape plantations: two campus entrances, one plaza, a set of dormitories, and several theme gardens. Student participants gain an introductory understanding of central design concepts, relations between people and places, methods of collaboration, both theoretical and practical. The effort is to empower student participants with a sufficient symbolic and pattern language that they can take a decisive role in shaping their immediate living and working environment. This presentation explores the possibilities and problems of a participatory project approach within a bureaucratically and hierarchically structured institution and classroom. The structure of institutional space, time, roles, events and authority present severe constraints to the ideal of participant initiated and implemented landscape projects. Developing and maintaining a coherent aesthetic direction, completing and maintaining projects within both institutional and organic time frames, and keeping everything alive over the years are challenges we have met, at times sacrificing the ideal of participation and at times reaping its rewards.

### **System Improvement Model In The Office Buildings Due To User's Requirements**

#### **Abstract.**

***Aluclu, Yclal (Dicle University, Turkey).***

Office buildings are regarded as very important constructions in the life of society. The usage function of these offices may be administrative, commercial or technical but the aim of these offices is to provide its employees a healthy and up to date technical facilities. To increase the productivity in these buildings is especially possible by detecting the user's requirement and to meet these requirements. There is much strong ties between studies made over the increasement of work productivity and psychological effect on the facilities and comfort it provides to the users. Since planning is to consider the future at length, the designer will increase the work productivity with physical planning and must constitute the employees a comfortable work atmosphere. In this study it has been pointed out that if the requirements of the users in the office buildings are designed completely, due to the user's satisfaction, the productivity in the office will increase. Because of this: -To change the organizations in offices very often, -Changing of the labor type, -Functional and due to causes originating from getting worn out for improving the comfort conditions, (physiological, psychological and sociological) which respond the user's requirement in a favorable way, an alternative improvement model has been constituted.

## **Environmental Management in Large-Scale Building Projects-Learning from Hammarby Sjostad.**

***Svane, Orjan and Johansson, Rolf (Built Environment Analysis, The Royal Institute of Technology, Stockholm, Sweden).***

In an old industrial and harbour area of Stockholm, a new city of 30,000 people will be built in the next ten years. The Hammarby Sjostad project is unique in its size and municipal organization as well as in its ambitious sustainability goals. In a case study based on interviews and document analysis, the environmental management process of this project is researched. The City of Stockholm will follow up the compliance with set goals, our study is a qualitative one focusing on the management process. We develop concepts and models as an aid for municipal management of future construction projects. Many factors outside the formal ones are considered important. Collected data is analyzed with the aid of pairs of concepts: the uncertainty of a unique project vs. the clarity of normal practice; formal, documented environmental management vs. the informal, less documented; focus on goals vs. solutions etc. Data is furthermore structured from a stakeholder perspective, including the municipality, its offices and companies, the developers, consultants and construction companies, with a main focus on the municipal project organization. By the beginning of 2001 preliminary results should be available to be presented in a paper.

## **Using Behavioral Research Techniques In The Execution And Design Of Retail Signs.**

***Childress, Craig (Envirosell Behavioral Research - New York City)***

The use of customer mapping, activity mapping, traffic flow studies, and exposure ratings in the understanding of signage design and positioning in retail stores such as the Gap, McDonald's, Upton's, and the United States Postal Service. How standard environmental behavior research techniques have been successfully adapted to the commercial world. Signage decisions are no longer based on "that looks good over there." Signage design and positioning is becoming a science with the designers using behavioral research data to help match signage design to customer behavior. Unobtrusive observational techniques were used to study customer interactions with directional, merchandising, and promotional signage. We will look at videotape from behavioral studies done in fast food, banking, mass merchandising stores, and supermarkets. Designing to fit customer behavior has proven to be much more successful than trying to force custom-

ers to fit signage design in the retail environment.

## **A Study On The Student Behavior In The Use Of Campus Open Spaces For The Renewal Plan Of Chung-Cheong College, Korea.**

***Kim, Hye-Jung (Myongji University - School of Architecture, Yongin, Korea).***

Education method has been changed rapidly since the development of the computer technology. The student campus life and the use of the space in the campus were also changed rapidly in Korea. The existing plan of Chung-Cheong College is inadequate for today's student life and for the future growth. In this context, new master plan becomes necessary to increase student satisfaction of campus life. The main purpose of the study is to develop new concepts of open spaces in relation with rapid changes of the campus life pattern in these days, based on the needs of students who are major users of the campus. Also, the aim of the study was to reflect the user's needs to renewal of campus. Walk-through interviews and participant-design methods were used in this study. In the user-participant design game, we have developed images of each exterior space for the contemporary college, and activity patterns in the use of campus open spaces. Open spaces adjacent to central library, classroom buildings, student union building, the gate of the campus, and promenade to the edge of the campus were focused to study in order to find the new meaning of the spaces in the relationship with the changes of the usage pattern of each buildings. The design guidelines were developed for redesigning the campus for increasing user satisfaction in the context of social change for the contemporary college, and activity patterns in the use of campus open spaces. Open spaces adjacent to central library, classroom buildings, student union building, the gate of the campus, and promenade to the edge of the campus were focused to study in order to find the new meaning of the spaces in the relationship with the changes of the usage pattern of each buildings. The design guidelines were developed for redesigning the campus for increasing user satisfaction in the context of social changes. The result of the study was applied to the new master plan.

## **The Considering Items Students Use When They Lay Furniture to Their Rooms.**

***Maki, Kiwamu (Jissen Women's University, Japan) and Koga, Takaaki (University of Tokyo, Japan).***

An experiment using scale models was carried out to know the considering items which decide the furniture layout. The subjects of the experiment were asked to make the best circumstances using the prepared fur-

niture in the indicated rooms. The subjects explained the reasons why the furniture was there each time they finished laying furniture. The reasons were divided to five major categories, Function, Environment, Atmosphere, Fitting and Remainders. We found out the difference of the mainly used reasons among the based on this category. Furthermore, three spaces of behavior, the working space, the relaxing space and the dressing space, were found in the analysis of the relation of the furniture expressed in the reasons.

### **Comprehensive and environmentally sensitive approach to building design and land use. .**

***McInerney, Chris (Charles Sturt University, Waaga Waaga, NSW, Australia).***

The new campus of Charles Sturt University at Thurgoon, in regional New South Wales, demonstrates the unique outcomes of a comprehensive and environmentally sensitive approach to building design and land use. The campus planning is disciplined by very stringent environmental design guidelines. The open setting is sculptured by artificial creeks and wetlands, which harvest all site stormwater for re-use. A major revegetation scheme, consisting of endemic species has been undertaken on the site, which was once degraded and eroded farm land. Grey water waste from all buildings, including student residences, is treated through wetlands. Dry composting toilets have been incorporated into the design of all new buildings. The buildings are articulated in rammed earth and recycled timber clearly expressing the University's environmental mission. Non toxic and PVC free materials have been used for all building finishes. The School of Environmental and Information Sciences comprises 2969 square metres of office accommodation for close on one hundred staff and post graduate students, specialist teaching space, research facilities for the Johnstone Centre for Parks, Recreation and Heritage and a herbarium. The Teaching Complex hugs one edge of the circular court that forms a nexus between the academic, and public precinct, and the more private residential precinct. It comprises a 200 seat earth covered lecture theatre, and a 100 place lecture facility, two 60 place flat floored teaching spaces and two 30 place tutorial rooms. This project will become a benchmark for the demonstration of a thorough intergration of all aspects of ecologically sustainable development, passive systems, and water-wise site development, in an area where water use and misuse have a dramatic effect on the land, and in institutional development where low up front costs are a priority.

### **Moderating the Effects Of Nature Art And Abstract Art On Anger In Work Environments: Demonstration Of The Anger-Provoking Potential Of A Battery Of Computer-Based Experimental Tasks.**

***Walker, Verrick (Texas A&M University, TX); Kweon, Byoung-Suk (Texas A&M University, TX); Tassinary, Louis (Texas A&M University, TX); and Ulrich, Roger (Texas A&M University, TX).***

Research has shown that people vary in their responses to anger-provoking situations. Therefore, any study of anger that employs a single experimental task may have limited success in observing anger among a broad range of individuals. Acknowledging this possibility, a diverse set of computer-based experimental tasks was employed in a study of the effects of nature art and abstract art on anger and stress responses to computer tasks performed in an office setting. This battery included three 'pencil-and-paper' tasks, developed by other researchers, and one original computer task. The paper-and-pencil tasks were adapted to the computer and modified to include social comparison feedback, such as 'the vast majority of subjects out-performed you on this task', and computer 'error' messages that might induce anger. Preliminary results suggest that the battery was effective at provoking anger, as assessed by Spielberg's state-trait anger expression inventory, across the range of subjects in the study. In fact, anger levels were higher than those reported by Spielberg for a comparable group of subjects. Development of the instrument (battery) and possible applications are also discussed.

### **Process and Product.**

***Fleischman, Richard (Architects Inc., OH)***

Planning is successful when development strategies are realistic and are associated with committed and proven private and governmental agencies. Their parallel efforts encourage others to meet specific goals. The mid 80's in Akron initiated a planning strategy referred to as "Span the Tracks" authored by the University of Akron. Conceptually, the university and the city felt that 18,000 students located adjacent to and in proximity to downtown Akron could make an economic impact on downtown. Therefore, we planned to expand educational facilities within the downtown area. This strategy changed the vision of both leadership of the City, the County and the University concerning the future of the City of Akron. The University built a new state of the art \$18,000,000 Polymer Science College Building contiguous with the Business District, the City built a new \$20,000,000 base-

ball stadium and the Akron-Summit County Public Library is now building a new \$50,000,000 main library. Together these 3 signature structures have and continue to create expansion concepts to complement the Urban Plan created in 1985. Process and product to date will be diagramed. The methodology of why? and how?, and the results will be clearly delineated. Current and projected economic opportunities will be monitored in order to measure levels of success. Existing and future programs reflecting an expanded vision for this city has been shared with the entire community resulting in a new theme "Imagine Akron in 2025".

### **Transformation of Office Environments from Industrial Revolution to 'Digital' Revolution.**

***Toker, Zeynap (North Carolina State University, NC)***

Work environments, particularly offices, are significant elements of architectural typology. This design project traces the transformation of spatial layouts of office buildings since the industrial revolution. The main objective of this study is to uncover how new work patterns introduced and developed in response to the changing nature of office work influenced the architectural design of this building type, through a comparative graphic analysis. The widespread use of digital equipment, such as desktop computers to process and flow vast amounts of information, has been one of the latest factors of change in the nature of office work and is therefore requiring a new approach to spatial reconfiguration of office buildings. Moreover, new conceptions of office work have led to the formation of new work patterns and terminology, such as telecommuting, hot-desking, hoteling, and so on. This study concludes with a comparative graphic analysis of appropriate architectural responses to different work patterns, from the industrial revolution until today. Connotations between different spatial layouts and work patterns, requirements and workplace terminology of different time periods are sought within this visual framework.

### **Perceived Image Of Office Buildings And Their Connotations With Work Patterns.**

***Toker, Umut (North Carolina State University, NC).***

As new work patterns arise, organizations and individuals become more conscious about the image of their office settings. However, research into imageability of offices has mostly been limited to interiors. The purpose of this study was to examine the relationship between work patterns and perception of office buildings' exteriors, through obtaining subjective responses of architects and non-architects. Un-

derstanding whether a difference exists between images attributed to 'new' and 'conventional' work patterns was a particular objective. A model of relationships between work patterns and image of office buildings' exteriors was developed. Photographs of office buildings representing six architectural styles were sampled from architectural literature. A self-administered questionnaire was designed. Subject groups of architects and non-architects evaluated sample office buildings on descriptive scales, expressed their preferences and perceived connotations with 'conventional' and 'new' work patterns. It was observed that 'high-tech', 'neo-modern', 'deconstructivist' styles and particular descriptive properties had connotations with new work patterns. The responses of two subject groups were not significantly different. Overall, the sensitivity of respondents implied that detailed research has to be conducted on exteriors of office buildings based on descriptive scales.

### **Telework, Women's Work, And The Delicate Balance.**

***Johnson, Laura C. (University of Waterloo, Canada), Andrey, Jean (University of Waterloo, Canada), and Doherty, Sean T. (Wilfrid Laurier University, Waterloo, Canada).***

Telework is alternatively described as a means of increasing the flexibility with which women balance their employment and family responsibilities, and as an 'electronic leash' connecting workers to colleagues and responsibilities for an extended day. A pilot study of a sample of female Canadian teleworkers from a large, financial sector firm used an electronic time-budget program to record participants' planned and actual activities over a seven-day reference period. This detailed record permitted comparisons of participants' telework days and their (in-office) non-telework workdays with regard to time spent in various activities, interruptions to the work process, and level of correspondence between the time they had planned and actually devoted to various activities. The latter measure provided an indication of the way in which telework affects workers' control over amount and scheduling of work time and family time. Locales for home-based work were mapped; the program explored reasons for locating work in various areas of the home. Personal interviews documented participants' comparisons between their home-based and office-based modes of work, and their views about the impacts of telework on their work and family. Results highlight the effect of work environment on the work process and the work-family balance.