

Sustainable Environmental Design Education (SEDE)

INDUSTRY SURVEY REPORT

May 2004

Prepared for the California Integrated Waste Management Board (CIWMB)
by Margot McDonald, AIA
Architecture Dept. and Renewable Energy Institute
Cal Poly, San Luis Obispo
mmcdonal@calpoly.edu

A preliminary survey of architecture and landscape professionals from industry was conducted during April 2004. The electronic survey was sent to professional listserv's. In addition, a database of over 100 allied organizations was developed. The purpose of the survey was to conduct a needs assessment of sustainable environmental design education considering both university and industry perspectives. We discovered that uncovering industry providers of sustainable design courses was much more difficult than comparable groups in education. Respondents were generally professionals in multidisciplinary architecture and engineering firms who were participants in continuing education rather than the providers. A two-part sequenced survey, of firms to identify needs and providers to identify potential outlets for a curriculum, would give a more complete characterization of professional opportunities and access. In reading and interpreting the results of this pilot study, remember that the sample size is very small and extrapolation of findings requires a full scale launch of the survey.

Survey Questions and Findings

QUESTION 1. What is the name of your organization?

There were 11 respondents in the pilot study. They are listed here by organization and city.

Environmental Works Community Design Center, Seattle, Washington

Tang G. Lee Architect, Calgary, Alberta, Canada

Interface Engineering, Inc., Portland, Oregon

CIWMB, Sacramento, California

BFGC Architects Planners Inc., Bakersfield (and San Luis Obispo), California (3)

SMWM, San Francisco, California

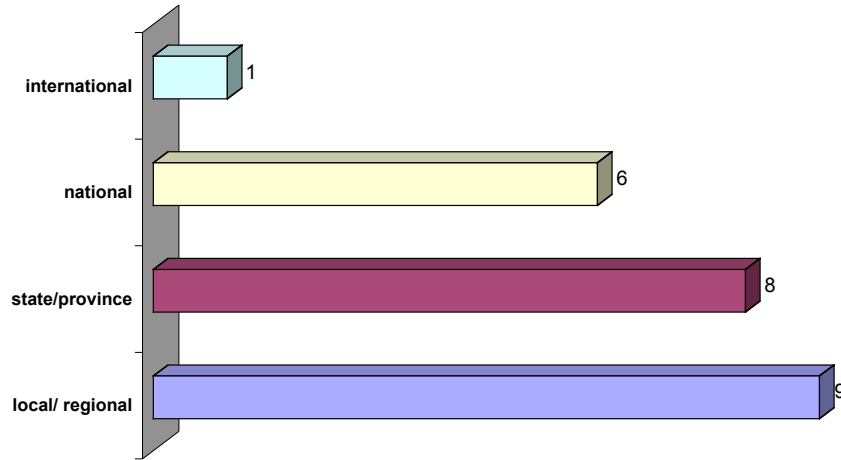
Van Meter Williams Pollack, LLP, Colorado

HDR Architecture, Inc., Washington, DC (metro area)

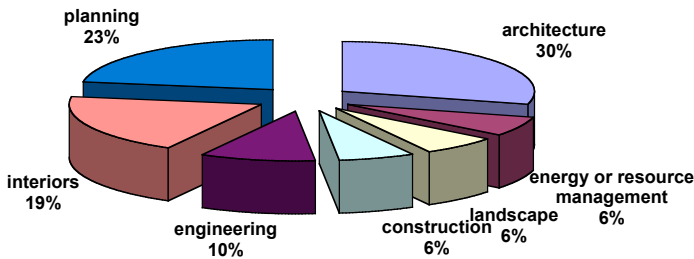
CCSF Facilities Planning & Construction, Shasta County, California

QUESTION 2. What regions does your organization serve? And, does your organization serve California?

Of the respondents, 82% serve California and 18% do not. The distribution of regions served is shown in the chart to the right.



QUESTION 3. What disciplines are represented in your organization's membership?



In addition to the professions listed to the left, respondents are also working in the fields of:

Indoor air quality; Sustainable design, energy analysis, lighting design; Waste Management; Construction Management Graphic Design and Green Design; Town Planning and Urban Design; Sustainable design; energy analysis; and, lighting design.

QUESTION 4. What is your profession?

In addition to the professions listed in the table below, these professions are also represented in the survey. Note that a respondent may be characterized by more than one category.

Waste Management Specialist; LEEDtm-AP; Green Design.

Professions	#/respondents in discipline
Architecture	7
Energy or resource management	0
Landscape	0
Construction	0
Engineering	2
Interiors	2
Planning	1
Other	3

Table 1. Professions of survey respondents

QUESTION 5. What is the status of continuing education for your primary profession?

Respondents were from different regions in the US and Canada, and requirements for continuing education (CE) varied. In some regions, CE is required for professional membership but not licensure (AIA cited). In other cases it is required (such as interior design certification). In cases where CE is mandated, there is no specific requirement for sustainable design.

Professions	Mandatory	Optional
Architecture	4	3
Engineering	1	
Interiors	1	1
Other	1	

Table 2. Continuing education requirements

Respondent comments:

This should be self driven; the continuous quest for knowledge and improving what we do. Shouldn't it?

QUESTION 6. Is sustainable environmental design a priority to your organization? If Yes, how is it expressed in your mission statement, organizational goals, etc.?

The survey respondents' organizations demonstrated a proclivity towards sustainable design as evidenced in their comments.

Replies	Organization
Yes	9
No	1
Don't know	1

Table 3. Sustainability and organization's goals

Respondent's comments on their mission statements:

Our mission statement reads, "Environmental Works is a non-profit Community Design Center dedicated to the improvement of the physical, economic and social environments by providing sustainable architectural and planning services to low-income communities in the Puget Sound Region."

"Consultants of Choice to the Built Environment" is our motto; followed by "Engineering for Comfort, Health and Productivity." [Interface Engineering, Inc.]

The firmwide Sustainable Architecture Mission Statement is: To develop awareness of sustainable architecture objectives and make them accessible to all through practical, innovative solutions. [bfgc architects, planners, inc.]

Function: Research and develop methods by which to embrace sustainable architecture in bfgc design approval. [bfgc architects, planners, inc.]

In discussion. [bfgc architects, planners, inc.]

See website www.smwm.com [SMWM]

Separate corporate staff/division. [HDR]

VMWP abbreviated Mission Statement:

"Van Meter Williams Pollack's approach to providing design & planning services is to stress the importance of working with the client throughout the design process. Our interpretation and evaluation goals are simple: to listen closely, to develop and present ideas, to discuss these ideas openly with the client and to decide the next step collectively. Through frequent meetings issues and alternatives are discussed and resolved, until the design meets with the client's satisfaction and within the budget limitations.

Van Meter Williams Pollack believes that a comprehensive design approach combining environmental, social, economic, contextual and client concerns, instead of specific design and architectural styles, will lead to the creation of more intimately scaled building and communities. On each of our projects, we believe that we have made a significant contribution to the function, attractiveness, character, viability and livability of neighborhoods, towns and cities that we have worked in.

Sustainable Design means satisfying the needs of the present generation without jeopardizing the needs of future generations. Our design approach utilizes technology, creativity and strategic planning to help restore the social fabric and conserve resources. This strategy is one of our methods of creating communities of unique places that express the continuity of our habitation and the interconnectedness of all people and their physical environment. It is our desire to create places that are worthy of affection and that can only enhance the surrounding environment."

QUESTION 7. Do you feel that educating your organization about sustainable environmental design would be beneficial to your members? Why or why not?

The survey respondents answered unanimously “yes” to this question. Here are some of their reasons.

Respondent Comments:

While it's included in our mission, and there is a general agreement that it's a 'good' thing, the means to practice sustainable environmental design are harder to understand and enact.

Must do or be obsolete.

The more we know the better we can do our work.

It's a priority to the Board

Consideration of the surrounding natural and built environment is one of the first consideration(s) in the proper programming of good design.

It would assist us in leading and educating owners to make decisions based on the most recent and tested/proven developments and advancements in sustainable and environmental design.

Absolutely. It's the way of the future, as it should be, and we all need to be informed and current on what's going on. From our secretarial staff to our principals, we keep everyone informed.

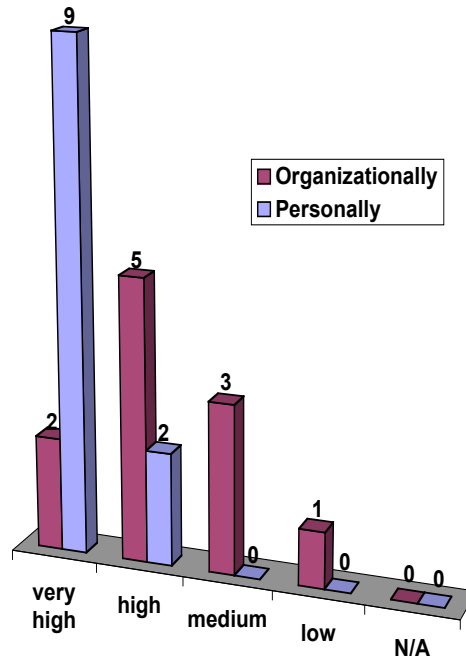
From a bottom line perspective, it's what clients are wanting these days, from a more moral perspective, it's absolutely necessary to build in responsible ways.

Be able to design better buildings and other structures

The passion and knowledge of those most dedicated can, must be shared. Sustainable Design is a rapidly changing field in terms of technologies and materials and what we learned yesterday was good but today brings more knowledge and experience. Likened to: the breaths I took yesterday worked but I probably should breathe today too!

QUESTION 8. How would you rate interest in educational opportunities (such as workshops, seminars, etc.) related to sustainable environmental design?

From the responses, individual motivation towards sustainable design is greater than the firms as a whole. When an individual was the principal, there was coincidence of interest level but otherwise staff interest varied throughout the firms. Also, a comment was made about the lack of inertia with large firms and their slowness to change.



Respondent comments (selected):

Often the cost is an issue--The recent expo that was in SLO was just too costly to attend, when it seemed that much of the same information would be available. I would be interested in attending some other types of seminars that deal with core issues such as global impacts--water resources, manufacturing, raw materials, reclamation, etc. Because I consider these issues in addition to what the manufacturers are telling me (!)...The answer is never simple, and the information is complicated, but, I like to draw my own conclusions.

QUESTION 9. What courses in sustainable environmental design have you taken in the last 12 months?

Over half of the respondents had taken one or more continuing education class in the last 12 months. The US Green Building Council and American Institute of Architects (AIA) were cited as sponsoring several of the workshops.

<i>Greenbuild 2003 Conference Sessions</i>	<i>USGBC</i>
<i>2005 Non-Residential Title 24 Standards</i>	<i>Edison Ag</i>
<i>Cool Roofs</i>	<i>Allied Roofing</i>
<i>LEED Green Building Workshop</i>	<i>USGBC</i>
<i>LEED intermediate Workshop</i>	<i>USGBC</i>
<i>Sustainable Design Training</i>	<i>Shasta College</i>
<i>Daylighting Seminar</i>	<i>AIA Golden Empire</i>
<i>Turning Green Into Gold</i>	<i>The Corporate Realty, Design & Management Institute - squarefootage.net</i>
<i>Golden Empire Growth Forum - Air, Transportation, & Growth</i>	<i>AIA-Golden Empire</i>
<i>Shading and Daylight Harvesting</i>	<i>USGBC Colorado Chapter</i>
<i>Developing Brownfields</i>	<i>AIA Convention</i>
<i>2003 IBC & IEC</i>	<i>City of Boulder CO</i>
<i>Groundsource Heat Exchange</i>	<i>Ground Source Heat Pump Consortium</i>
<i>ULI Lecture - New Urbanism</i>	<i>Urban Land Institute (ULI)</i>

Table 4. Continuing education courses taken by respondents

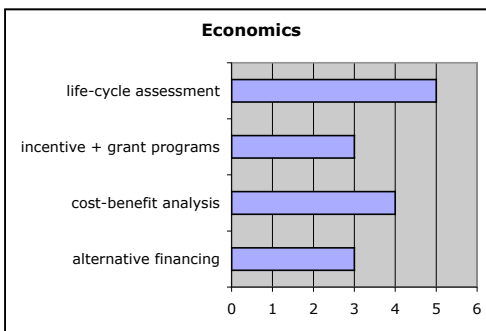
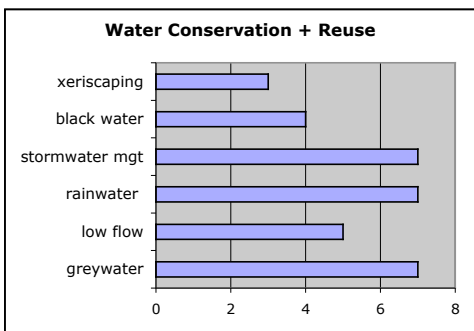
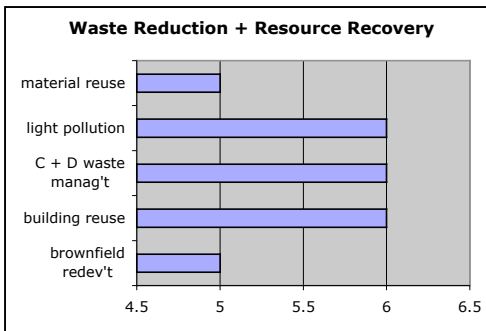
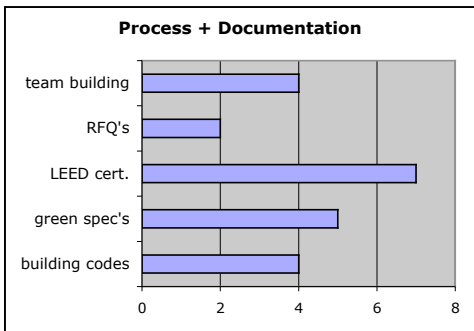
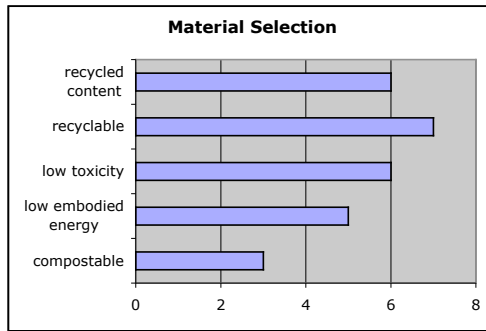
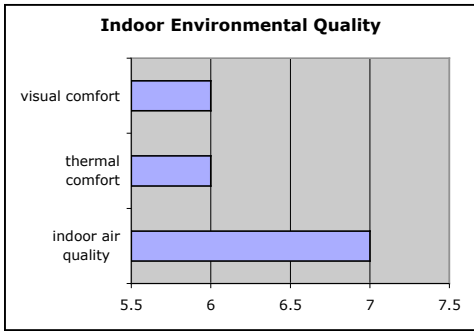
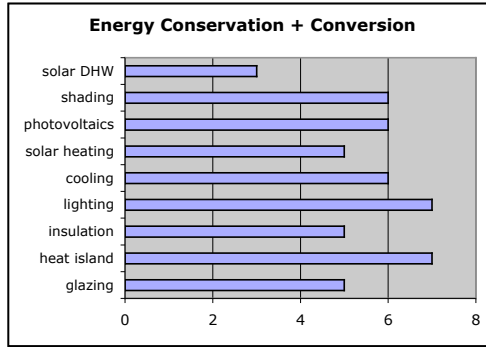
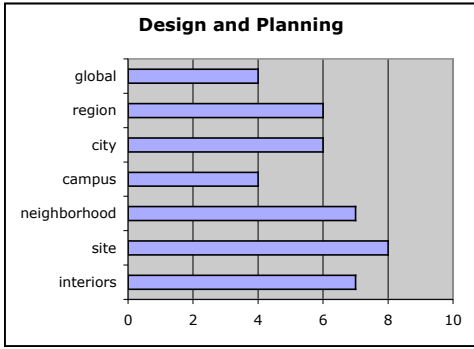
QUESTION 10. What topics were covered in these sustainable environmental design courses?

Respondents attended workshops that covered sustainable design topics in the following sequence. *Economics* stands out as one of the least covered topics in these workshops.

Sustainable Design Category	Average frequency (topic covered)
C. Indoor environmental quality	6.3
A. Design + planning	6.0
F. Waste reduction + resource recovery	5.6
B. Energy conservation + conversion	5.5
G. Water conservation + reuse	5.5
D. Material selection	5.4
E. Process + documentation	4.4
H. Economics	3.75

Table 5. Sustainable Design Categories covered in Continuing Education Classes

A more detailed distribution of the subtopics covered in shown in the charts below. *Site* under *Design + planning* was the most frequently selected subtopic.



QUESTION 11. Name five resources (such as books, videos, web sites, etc.) that have helped you most to learn about sustainable environmental design.

The following resources were identified by name as most useful for learning about sustainable design. Note that some publications are also available electronically and some organizations also have web sites that provide resources so some of the items below could be cross-listed. The number of times an item was cited is in parentheses after the name.

Publications (magazines and journals):

Draft of the Sustainable Building in Indian Country
Environmental Building News (5)
Environmental Design and Construction
Greenclips

Web sites and listserv's:

Big Green List Serve
biperusa.biz
Building Green.com (3)
CIWMB Green Building web site
Collaborative for High Performance Schools – California (www.chps.net website)
coolroofs.org
edcmag.com
EPA website
Oikos.com
sustainableschools.dgs.ca.gov/sustainableschools/
US Green Building web site (7)

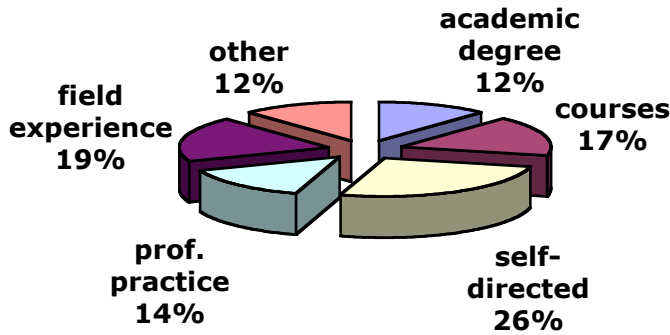
Books and videos:

Biomimicry (by Jeanine Benyus)
Bioclimatic Skyscraper (identified as “green high rise book” , by Ken Yeang)
Blue Vinyl
Cradle to Cradle (by McDonough and Braungart)
Design with Nature (by Ian McHarg) (2)
Green Architecture (by James Wines)
Heating Cooling Lighting (by Norbert Lechner)
House, Form and Culture (by Amos Rappaport)
Mechanical and Electrical Equipment and Systems for Buildings (by Stein & Reynolds)
Natural Capitalism (by Lovins et al)
Sustainable Resource Guide, AIA
Thermal Delight in Architecture (by Lisa Heschong)

Organizations:

ADPSR
In-Office workshops
Local AIA chapter workshops (including Turning Green into Gold Seminar)
Society for Building Science Educators
Utility Company Seminars

QUESTION 12. What prior education or experience do you feel has qualified you to practice sustainable environmental design?



Respondents identified *self-directed learning* that includes books, magazines, and the Internet as the most common way that they have become educated on sustainable design. This is not surprising because of the relative newness of the topic in universities and lack of opportunity to design projects with sustainability as a criterion. In the written comments section, on

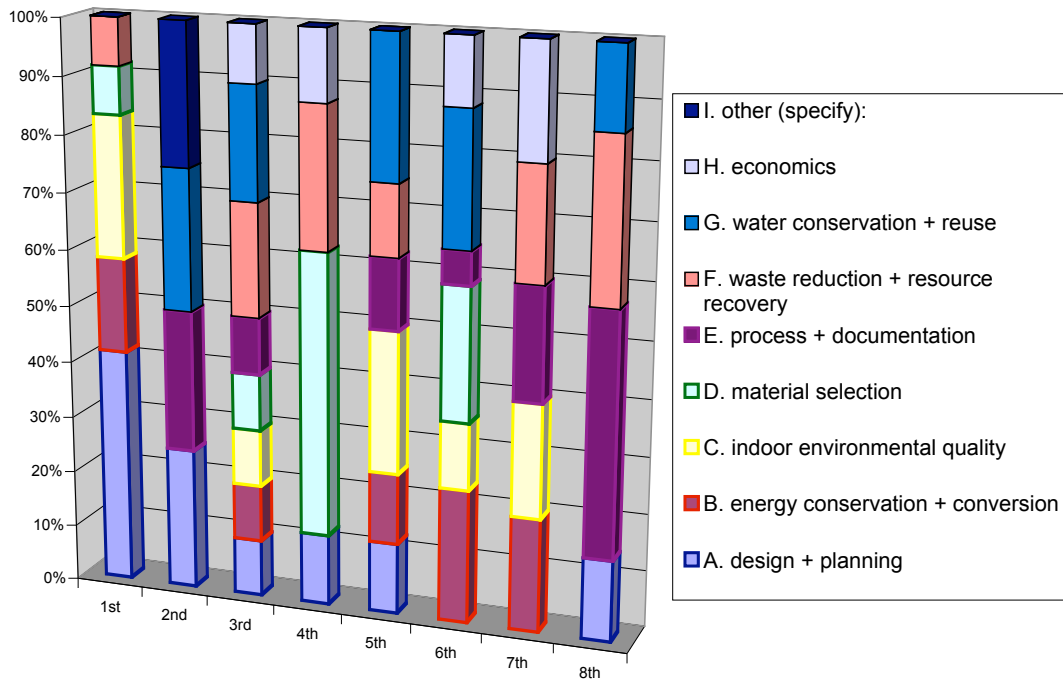
the job training, an “intrinsic interest” in the subject, and some university experience (either teaching or as a student in a green materials class) provided at least part of the what allowed practitioners to feel qualified.

QUESTION 13. Identify and rank the topics that should be addressed in sustainable environmental design course materials.

The highest demand for course topics was in *Design + planning* followed by *Material selection*. The other topics that were chosen with the highest frequency in the top four positions (ranked 1st to 4th) are given in the table below.

Ranking	Category	frequency chosen
Ranked in 1 st – 4 th priority	Design + planning	8
	Material selection	6
	Waste reduction	5
	Indoor env’l quality	4
	Economics	4
	Energy	3
	Water conservation	3
	Process + doc’t	2

Table 6. Topic most in demand for new sustainable design course materials



Respondents' comments:

Life Cycle/Value Engineering

I put Economics high on the list because in a free society with a capitalist economy the speed an ideal is incorporated into common practice is dependent on it being profitable.

These are often inter-related and cannot really be separated or extracted. A holistic approach with a view toward synergies is essential after backgrounds in each of the fields is established. Urban Design vs Urban Planning and the social, environmental, and economic implications of our country's patterns of development over the last 50 yrs.

QUESTION 14. Does your organization currently produce any educational materials or courses for sustainable environmental design education? If Yes, please describe the materials and courses here.

Sixty percent of the respondents indicated that they did produce materials for sustainable design education while 40% did not. Examples of their materials are listed below.

Respondent comments:

We've developed a public-access green building resource library. As part of the library, we developed a series of fact sheets on green building materials - specific to lower-income projects. Though we haven't produced any courses, per se, we have given workshops and talks about our work greening low-income housing. Additionally, I individually have taught an introductory environmental control systems course at the

University of Washington and the energy unit of the Sustainable Building Advisor Program at Seattle Central Community College.

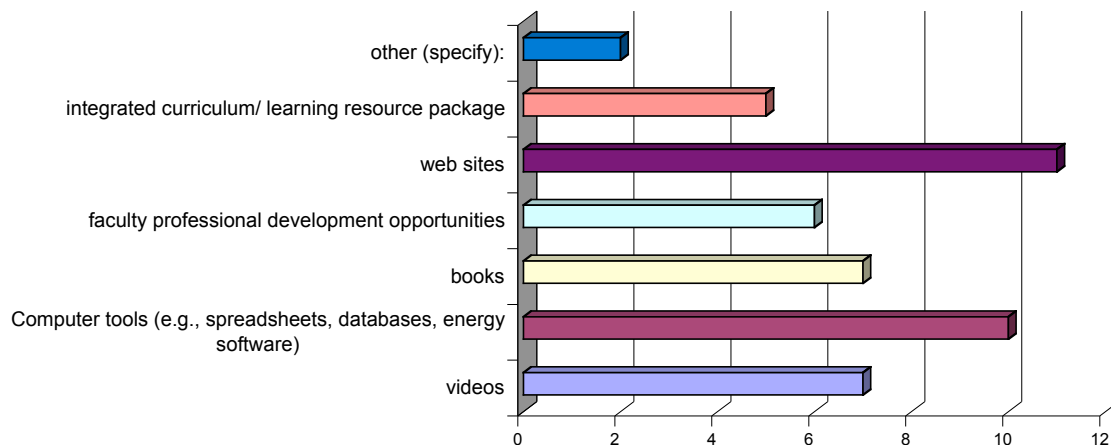
Green Building information materials on the CIWMB's web site

Our Green Design Principal, Anthony Bernheim, is a well known speaker, key note speaker and educator on the many facets of sustainable design.

Electronic Newsletter; White papers; Training for clients

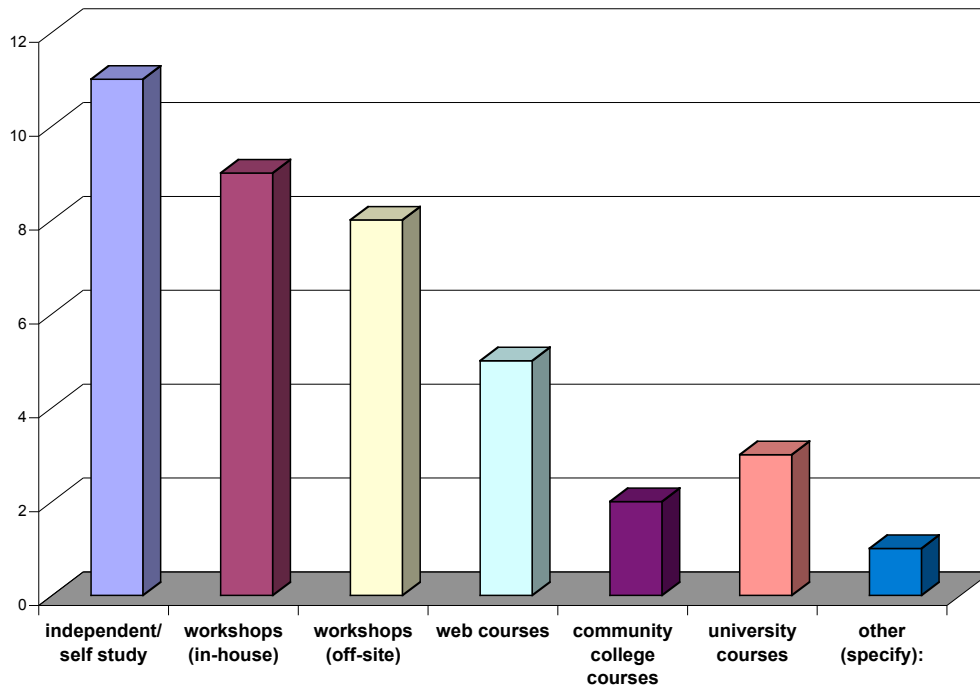
QUESTION 15. What educational resources would help you get started with or improve sustainable environmental design education within your organization?

Respondents chose web sites followed by computer tools as the most valuable resources to improve sustainable design education in their organizations. Since many firms are engaged in in-house workshops, they are also looking for templates that might help with setting up these learning opportunities.



QUESTION 16. What is your preferred method for learning about sustainable environmental design principles and practices?

The responses to this question make it clear that professionals, not surprisingly, choose opportunities that are efficient and flexible such as self-directed learning and in-house workshops. Problems cited with taking university courses to gain this knowledge are the expenses involved. The benefits of periodicals being most current was also cited.



QUESTION 17. What are the obstacles to obtaining sustainable environmental design education within your profession?

Obstacles to obtaining sustainable design education were mostly (and not unexpectedly) *time* and *money* but also included a lack of consolidated information especially on materials and proximity to such venues.

Respondent comments (selected):

Convincing those with the purse-strings that the initial extra effort is worth doing.

In the interiors field, with the specification of many different types of products, it can be overwhelming to determine what products are the best to use and what products are not.

Cost of green buildings (perceived high cost) and reluctance of designers to specify what they perceive as ugly materials lacking in design esthetics.

manufacturer's greenwashing; lack of consolidated source of info on materials

... Opportunities should be more mainstreamed.

QUESTION 18. How could a model curriculum for sustainable environmental design help you overcome these teaching obstacles?

Respondents identified a range of ways that education could help them overcome obstacles. Some involved flexibility, cost, and access. Others addressed specific topics and enforcement (such as licensure requirements creating a justification for this material). One respondent noted that the need for this type of material was dependant on where a professional was in their career development.

Respondent comments:

Traveling workshops.

Not sure this is needed. Lots depends on where you encounter the topic in your career development.

Educate in Value Engineering.

I believe it would make research and implementing sustainable environmental design more accessible to our firm.

Licensure would certainly lend credibility

Very easily, if it is reasonably priced and widely disseminated.

I would like an objective, product research data base (similar to BEES) that would consider all factors that make a product green, including raw goods, manufacturing, IAQ, initial cost, life cycle cost, maintenance, and disposal after a useful life-- I have created a spread sheet that I use to consider life cycle cost that I use to talk to Clients about different products--but, it considers only initial cost and maintenance cost over time. I like BEES, but, it isn't updated--and they have no plans to add more products to their items at this date. So what good is that in an everchanging market?

QUESTION 19. Are there any other key accomplishments or deficiencies you would like to share about your organization's current role in sustainable environmental design? If Yes, what are they?

Seventy percent of the respondents had information to share about their organizations.

knowledge of financing from developers point of view would be useful

ROI (return on investment) and Capitalization knowledge is lacking. These are useful tools for non-speculative developers and assist us in making case for 'green' buildings.

We developed a green materials outline spec with options ranging from standard to standard +1 and +2. This assists OAC team in pricing alternates and evaluating the cost implications of each option. Unfortunately this does not fit well with the holistic view of a building and only looks at systems and materials in isolation

Have been operating a grant funded initiative focused on increasing our organization's sustainable design capacity.

We have made a concerted effort to train LEED-AP personnel for each of our offices and are incorporating Sustainability language in our Master Specs. What we lack are Clients willing to implement the standards because of initial budgets.

I believe one issue is being able to convince owners of the benefits related to sustainable design over time. Generally speaking, owners tend to pay more attention to first costs.

design esthetic trumps any efforts at sustainability

Dedicated team of professionals offering a broad range of services. See www.HDRinc.com

QUESTION 20. What do you think would be the best way to promote sustainable environmental design practices within your organization and within your professional industry?

Comments centered on proof of concept through documented case studies and other communication media.

Respondent comments:

Mandatory course on sustainable design.

Success stories, detailed case histories, good cost models

Continuous Workshops (in-house)

Continued Public Awareness, Streamlining of documentation for compliance, incorporation of principles into standard practice

By speaking of the long term benefits of sustainable design.

I think it's a process. Once it starts happening in projects, and people who aren't familiar with the practices begin to see how successful they are, then attitudes begin to change. I think the benefits have to be seen to be believed.

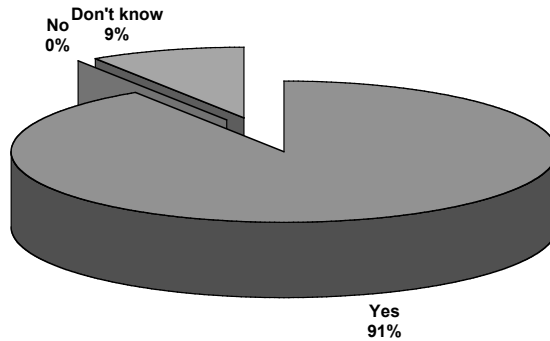
Gain credibility and technical knowledge.

Communication; funded support for initiatives from within.

Organization is fully behind Sus. Design principles. Infectious enthusiasm and energy are contagious.... We need to educate and energize others. Sack Lunch seminars have been useful in getting attendance at these sharing/educational sessions. We could use some suggestions

QUESTION 21. Do you think that sustainable environmental design education should be required for future landscape and architecture professionals (for example, as part of the licensing exam or professional school accreditation requirements)? Why or why not?

A majority (91%) indicated that they thought sustainable design should be required for licensure or accreditation. However, comments also indicated that the expectation was for this subject matter to become mainstream as resources become more limited.



Respondent comments:

Students should be made aware of issues of sustainable design, just as they are expected to learn the historical background of architecture.

It should be part of a comprehensive curriculum and should be tested. But the emphasis should be on practical solutions not extreme philosophy.

In time, sustainability will be a requirement rather than a choice due to limited available materials. The sooner Architects and Designers realize this the better.

Because it's the future.

Absolutely--CREDIBILITY!!

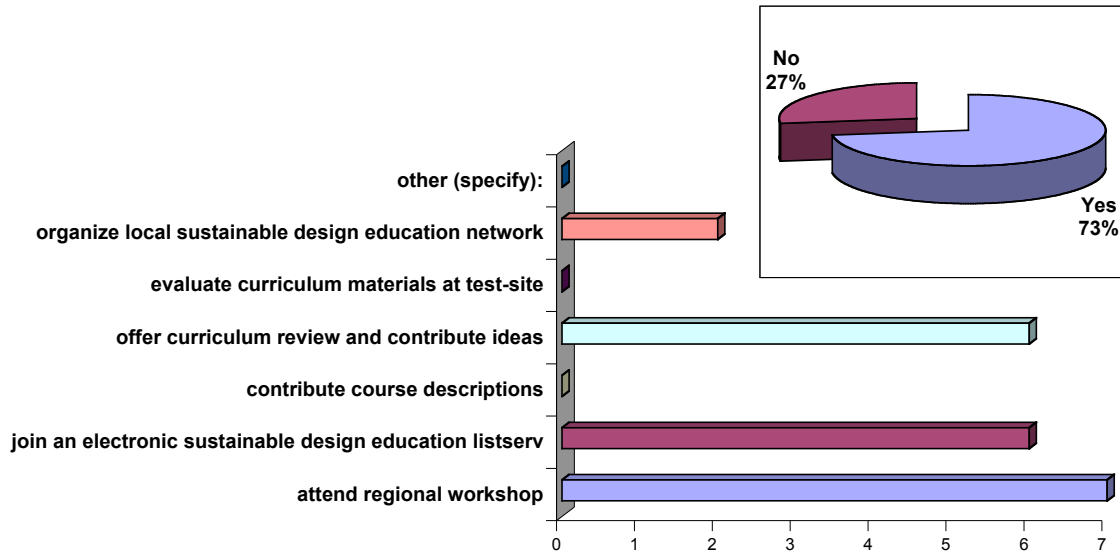
Absolutely!!!!!!

Other resources will not be here forever.

today... doing the right thing or making the right choices will become tomorrow's necessities. We have to change the way we look at our development patterns, consumption etc. Forseeing LEED certification to increasing Levels (silver, gold, platinum) for all Fed, State, Muni bldgs is not unrealistic. This will roll over into the private sector as well since smart money follows public investment...

QUESTION 22. Would you like to be an active contributor to a curriculum for professional and post-secondary sustainable environmental design education? If Yes, how would you like to contribute?

The greatest interest in participating with a sustainable environmental design curriculum was in the area of attending regional workshops as well as listserv participation and contributing ideas. In the comments section, respondents lamented about a lack of time to do more.



QUESTION 23. Are there key individuals or groups within your organization who are currently (or who would be interested in) promoting sustainable environmental design principles within your organization and their professional industry? If Yes, please note contact information below.

Provided to CIWMB under separate cover.

QUESTION 24. Please provide us with your contact information.

Provided to CIWMB under separate cover.