

Green Building Awards as a tool for building knowledge of the sustainable design of interiors

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ABSTRACT: Compliance with the principles of sustainability of interior design education in Polish higher education institutions is addressed in this article. Conventional interior design teaching provides students neither with systematised knowledge on sustainability issues nor with appropriate competencies to create interior spaces of high environmental performance. Improvements in currently employed curricula should not be limited to the implementation of professional tools, including multi-criterial environmental evaluation systems, as supportive educational means. They should lead to the development of a compulsory course on sustainable architectural design offering theoretical knowledge combined with multidisciplinary environmental workshops. Development of students' design projects as contributions to dedicated architectural competitions should be included in the modified curriculum, to enable students to understand the complexity of sustainability principles.

INTRODUCTION

The need to implement sustainability principles in interior design curricula is not addressed explicitly in the official regulations accepted in 2007 by the Polish Ministry of Higher Education. These define the education standards at faculties of interior design and the precise content of interior design teaching programmes, but there are other exigencies in the document. These requirements are for interdisciplinarity in the interior design field; an holistic approach to design decision-making, as well as exploration of the human-environment interconnection within the courses delivered to interior design students. These were included in previous interior design education standards, although imprecisely formulated. It seems to imply that interior design teaching provides an excellent opportunity for sustainability education [1].

With the increasing recognition of environmental sustainability by researchers and practitioners in interior design [2][3], modifications of established interior design education programmes toward environmental contextualisation of inner spaces and their components [4], are necessary. Adjustments to the existing curriculum, to provide interior design students with systematised knowledge on sustainability, should be centred on introducing teaching methods which offer students practical learning opportunities. This is in accordance with the sustainability education characteristics of Nichols and Shorb [5], and expressed as *transformative and experiential learning*.

The interior design curriculum adjustments, proposed by the author in previously published articles concerned changes within the structural teaching framework, as well as within design methodology by the introduction of selected professional methods and tools, as supportive educational means [6-8]. Proposals regarding the transformation of the teaching process addressed in particular:

- 1) Exploration of interdisciplinary students-practitioners-consultants' workshops and seminars.
- 2) Development of the experiential and innovative model of educational programme around building construction, to cover basic problems related to the realisation of sustainable interior design [6].
- 3) Establishment of autonomous teaching modules based on lectures, seminars and multidisciplinary student workshops [6].
- 4) Inclusion of the multi-criterial environmental evaluation systems, as a sustainability decision-making tool, as well as integrating the platform in interior design education [7].
- 5) Employment of graphic visuals to illustrate the sustainability features of spatial arrangements and technical solutions [8].

In this article, another proposal is discussed concerning the modification of the interior design curriculum based on the development of undergraduate students' design projects as contributions to architectural competitions oriented to the evaluation of architectural design compliance with sustainability principles.

ENVIRONMENTAL SUSTAINABILITY ISSUES IN THE INTERIOR DESIGN CURRICULUM

The existing interior design educational framework provides students neither with systematised knowledge on sustainability issues, nor with competencies to create interior spaces of high environmental performance. Questions to students regarding the accomplishment of sustainability objectives in interior design range from the general sustainable issues of resources efficiency, waste management, energy saving and optimisation of indoor environment quality to the highly detailed problems addressing the application of sustainable design methods and techniques to design projects. These may be, for example, employment of constitutive interior components as passive design instruments [9]; optimisation of interior environment quality parameters with interior component-forming or specification of eco-efficient building materials, *which is possibly the simplest Design for Environment principle to incorporate in the design process* [10].

These topics usually occur within different teaching courses to address specific problems, and therefore are seen by students as separate concerns. For example, they perceive the specification of recycled building materials to form furnishings or finishes or the implementation of interior green walls, as separate from sustainable design strategies i.e. reduction of resources consumption, building systems performance, enhancement of indoor environment quality. Design studios, although providing students with opportunities to address sustainability conserve the fragmented and disconnected knowledge of environmental sustainability in interior design.

Sustainable interior design is not sufficiently embedded in courses. The existing interior design teaching framework offers students a facultative lecture course on Environmentally Sustainable Architectural Design which discusses sustainability and interior design. This requires modifications to provide students with a comprehensive approach to sustainability requirements and to encourage them *to develop [an] holistic vision of an integrated design* [11]. These improvements comprise, as discussed further in this article, the development of students' course design projects as contributions to architectural competitions oriented to the assessment of sustainability concerns with application of a professional design tool; namely, multi-criterial environmental evaluation.

ARCHITECTURAL COMPETITIONS IN THE INTERIOR DESIGN TEACHING FRAMEWORK

In the existing interior design teaching programme, there are many different learning activities, including multidisciplinary workshops with participation of students of different specialties, seminars on building products and architectural competitions. The latter serve as practical validation of the students' knowledge gained within theoretical courses, while responding to the particular demands formulated by firms or institutions organising these contests (e.g. developers, building products suppliers and furnishing manufacturers). The competition conditions usually require design proposals that remain in accordance with the organisers' market policy or image.

The Polish Green Building Council, a non-profit organisation, has launched annual Green Building Awards. The green building design awards include sustainability criteria ratings i.e. leadership in energy and environmental design, and the British research establishment environmental assessment method. The awards are addressed to the professional designers, developers and building products manufacturers, as well as architecture and interior design students.

There is a special architectural competition category for students' design projects focussed on compliance with environmental sustainability principles. This architectural competition focused on environmental issues in design provides students with a different approach to interior design.

METHODOLOGY

The objective of the study was to verify the inclusion of architectural competitions with sustainability criteria into the interior design teaching programme. This could be a supportive learning tool in building up a comprehensive and systematised knowledge of sustainability issues. The competitions are an effective way to promote sustainability as design guidelines.

The significance of the Green Building Awards in building knowledge of sustainability was studied within the project part of the Building Construction course, through students' design projects developed as competition entries. Students were to include in their projects the knowledge acquired from the preceding lecture courses on Building Construction, as well as Environmentally Sustainable Architectural Design. These joint workshops on the design project entries have widened the *contemporary issues* module, as proposed by Yost and Lane [12], to evaluate students' proposals.

A three-part survey was conducted among students participating in this special class using open-ended questionnaires. In the first section of the survey, students were asked to rate their understanding of environmental issues in forming interior spaces, prior to their enrolment on the elective course on Environmentally Sustainable Architectural Design. Then, they were challenged to identify the results of their design projects prepared in accordance with sustainability principles.

The third section of the survey concerned students' assessments of their abilities and skills, developed while compiling projects within joint practical design modules of courses on Building Construction, as well as Environmentally

Sustainable Architectural Design. Students were asked in particular to reflect on the design projects prepared as competition entries, with respect to the multi-criterial environmental measures, as in the reference guides.

CASE STUDY

The group of six students, out of a total of 22 who attended third year undergraduate interior design, was invited by the author (as project co-ordinator), to develop their semester design projects worked on within the project-learning module of the Building Construction course, as contributions to the dedicated architectural competition. The students chosen to work on those design projects were attending the Environmentally Sustainable Architectural Design lecture course that covered the fundamentals of environmental sustainability and design methods.

Students worked with a prepared checklist to identify different factors and variables influencing the decision-making process. The rating system gave credits for optimisation of the environmental performance of interior spaces. Research methods included literature reviews of models of the working environment; observational studies on co-working spaces; as well as interviews with users. Students attended weekly seminars, while working on their projects and presented oral and multimedia progress reports to other participants. Class discussions on the proposals replaced the conventional critique.

The subject of the students' design projects was development of a co-working space assigned to a start-up (e.g. consulting, interior design, real estate), situated in an existing commercial centre. The choice of an office location was to allow exploration of the functions of the interior, as these places are an *excellent tool for teaching people about the principles of sustainability* [13].

A spatial layout based on the business-club office organisational concept was adopted with an activity-based workplace (ABW) model (e.g. hot-desking workstations, telephone booths, multi-functional circulation areas). These provided for various forms of co-working activity for young professionals. These activities corresponded to the proposed spatial arrangement of the open working space; the accessibility of auxiliary spaces; adaptability of office spaces; multi-functionality of interior components; as well as specification of eco-efficient building materials and products.

The ABW concept adopted in the projects was to assure the flexibility in use of open office spaces; respect timetables for occupancy; and to facilitate the different forms of work (e.g. informal meetings, conceptual work and creative workshops). This model conforms to the resource efficiency-oriented sustainable concept of access to - rather than ownership of - such things as, for example, a desk, appliances or equipment, to allow the sharing of meeting rooms, conference facilities or individual workstations. All these features were verified and assessed for their compliance with sustainability requirements. Students' design projects addressed the quality of the indoor environment, as well as the materials and resource evaluation criteria included within the certification system reference guide, as measures for the high environmental performance of interior spaces and to extend the time of use and to *densify* the existing space.

The students were encouraged to apply different modes of presentation when submitting design projects in the form of posters. These methods comprised:

- 1) Perspective drawings to give the overall idea with emphasis on the educational aspects of the designed setting and interior components.
- 2) Building drawings to explain technical aspects of proposals including sustainability issues.
- 3) Visuals to explain the environmental context of interior components to encourage occupants' involvement with sustainable practices (e.g. convenient location of spaces to store recycling containers for collection of post-consumer waste; accessible lighting controls; indication of content of recycled materials).
- 4) Schemes and diagrams to illustrate functional and spatial relationships between spaces.

The main goal was the practical application of pro-ecological design strategies with professional design tools, as instruments to systematise theoretical knowledge on sustainability and to employ sustainable interior design thinking. They were to develop innovative and sustainable interior designs into existing spatial structure to decrease the environmental impact on the interior space, while forming a healthy work setting of high indoor environment quality.

The objectives were to provide students with an experiential learning tool; namely, the development of design projects dedicated to architectural competitions, so as to:

- employ social, ecological and economic factors of environmentally sustainable interior settings;
- recognise design strategies, to fulfil principles of sustainability;
- apply innovative design methods to accomplish sustainability requirements;
- prepare for the energy and environmental green associate examination, through the students' design projects-competition entries in accordance with the environmental design interior design and construction rating system, to evaluate the environmental performance of commercial interiors.

Design strategies proposed by the students were assessed for compliance with sustainability requirements, as per the rating system. The sustainable approaches concerning occupants' health and well-being, in the indoor environment

quality category, as well as resource efficiency, in the materials and resources rating system basic category, were recognised by students as decisive for interior high environmental performance.

The human-centred strategy of optimisation of interior spaces, as recognised in the indoor environmental quality evaluation system basic category was the most intensively exercised approach by the students. The strategies referring to this and applied by the students comprised the following:

- 1) Design for optical comfort.
- 2) Design for acoustic comfort.
- 3) Design for indoor air optimisation;
- 4) Design for occupants' psycho-physical comfort.

Innovative and passive design methods proposed by the students, enabling realisation of the sustainable strategy to improve occupants' comfort in interior spaces, comprised the following:

- Interior space planning, and component bright-colour finishes to promote deeper penetration of daylight from the skylights of adjacent commercial centre promenades to remote areas of office space, thus improving the natural light level.
- Controlled component volumes to enable undisturbed daylight transmission.
- Interior components (e.g. space dividers, partitions or multi-functional structures of furnishing) formed as acoustic buffers to assure reduction in sound transmission and speech privacy (see Figure 1).
- Biological walls integrated with space dividers and partitions to improve inner air relative humidity and achieve the biophilia concept (see Figure 2).
- Selection of sound-absorbing finishing building materials and appropriate placement.
- Specification of certified building materials of low volatile organic compounds or harmful chemicals, to avoid emission of toxic substances.
- Complementary standing workstations assuring users' physical comfort, as supplementary informal meeting spaces situated within circulation areas.



Figure 1: Interior components as acoustic buffers to assure speech privacy in accomplishment of human-centred sustainable design. (Author: K. Milchina, Supervisor: M. Celadyn, Source: Archive of the Faculty of Interior Design, Jan Matejko Academy of Fine Arts, Kraków).



Figure 2: Interior components structured as biological walls to improve air relative humidity, to meet the human-centred sustainable design requirement. (Author: P. Pasztaleniec, Supervisor: M. Celadyn, Source: Archive of the Faculty of Interior Design, *Jan Matejko* Academy of Fine Arts, Kraków).

DISCUSSION

The findings of the survey revealed the students' environmental awareness for creating suitable interior spaces and components. Results of questionnaires supplementing the design projects showed the interior design students' interest in improvement of their abilities toward broad implementation of professional design methods and tools (e.g. green building certification systems), to accomplish the environmental sustainability requirements. Students responding to the second section of the questionnaire, concerning the results of their involvement in making a design project prepared in accordance with the sustainability requirements, identified as mostly beneficial:

- 1) Evolution in their attitudes toward interior design practice affected by an environmental context.
- 2) Recognition of sustainability measures to be introduced within the environmentally responsible interior design process.
- 3) Adoption of environmental perspective in creating inner spaces and their components, as a way to find innovative design solutions.

In the third section of the survey, students were asked to determine if the work on design projects as competition entries was informative enough, allowing an increase in knowledge. Thus, students had an opportunity to share reflections on the inclusion of rating systems criteria as design project submission prerequisites, as well as innovative design teaching tools. They assessed the following design instruments as important principles to build on:

- 1) Respect sustainable demands as essential in interior design decision-making.
- 2) Integrate sustainable features into the interior design project.
- 3) Design solutions that comply with environmental requirements as equal to functional, formal and aesthetical values.
- 4) Recognise certification reference guides as valuable instruments in systematic implementation of sustainable principles; they are the means of verification of the characteristics of systematic projects.

The results of design projects developed within the workshop, as stated in the accompanying questionnaires, confirmed the students' positive reflections on the effectiveness of the applied design method in gaining commitment to environmental issues within interior architectural design.

CONCLUSIONS

The project-as-competition entries-based learning design module within the Building Construction course has been applied as a means of complex and systemic incorporation of environmental considerations into the interior design curriculum. Students' exposure to the rating system criteria as design metrics, while working on the sustainable co-working space, allowed them to apply design solutions more comprehensively within environmental and temporal contexts.

Seminars on design projects prepared within the design module of the Building Construction course became the practical module of the facultative lecture course on Environmentally Sustainable Architectural Design, thus focusing on project-based learning [9]. Architectural competitions, oriented to the assessment of practical implementation of sustainability strategies in architectural design, can be identified as innovative and experiential learning tools in creating environmentally responsible interiors. Introduction of this supplementing educational instrument into the design process allows connection between theoretical knowledge gained in lecture courses on sustainability considerations in interior design and practical implementation exercised with professional tools (i.e. multi-criterial environmental evaluation).

Therefore, dedicated architectural competitions play an important role in transforming interior architectural design into exploration of assigned environmental and temporal contexts. These are substantial features of interior settings and components, as well as inspiring drivers for developing innovative design solutions.

The study enabled examination of the Green Building Awards as a complementing educational tool to:

- 1) Integrate the Environmentally Sustainable Architectural Design facultative lecture course with other teaching courses offered to undergraduate and graduate students.
- 2) Provide students with systematised knowledge grounded on sustainability considerations, and the abilities to implement it creatively into design projects.
- 3) Increase students' commitment to the relevance of rating system measures in the interior design area of study, and to build on their competencies in integrating environmental multi-criterial evaluation systems into future professional practice.
- 4) Encourage students to employ the rating system as a qualitative and quantitative tool to assure high environmental performance of interior settings.

Inclusion of the dedicated architectural competitions as a design tool by which to respect sustainability principles within the design-making process can be considered the research-through-design project submission educational method, with rating system standards, and as teaching criteria for implementation of sustainability imperatives into students' projects. Submission of projects to the architectural contests that evaluate the environmental performance of designs, as an experiential interior design learning tool, is a way to implement sustainable design thinking in accomplishing the requirements of environmental responsibility in interior design.

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