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## „EDUCATING BUILDINGS” – LEARNING SUSTAINABILITY THROUGH DISPLAYED DESIGN

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## „KSZTAŁCĄCE BUDYNKI” – EDUKACJA PRZEZ EKSPOZYCJĘ ROZWIĄZAŃ ZRÓWNOWAŻONYCH W BUDYNKACH

### Abstract

Technical development, legal requirements, economic impulses and public awareness lead to increased demand for sustainable buildings. Constantly developing increasingly sophisticated technologies become more and more incomprehensible and unfamiliar to occupants and visitors. Exposing sustainable solutions attractively and presenting corresponding information about them directly in the buildings, will increase the knowledge of sustainability. As a result, acceptance will rise, occupants are inspired to proper use and encouraged to future sustainable constructions. Based on analyses of built examples and planning an innovative model building, new concepts and project recommendations for exhibiting sustainable solutions and techniques have been developed. They are compiled in a bilingual compendium “Educating Buildings”.

*Keywords: sustainable architecture, education for sustainable development*

### Streszczenie

Postęp techniczny, wymogi prawne, bodźce ekonomiczne i wzrost świadomości społeczeństwa podnoszą wymagania w stosunku do rozwiązań zrównoważonych w budynkach. W efekcie wzrasta ich kompleksowość i pojawia się konieczność implementacji nowych technologii. Dla użytkowników stają się one coraz bardziej niezrozumiałe i obce. Przez atrakcyjne wyeksponowanie rozwiązań zrównoważonych i udostępnianie informacji o nich bezpośrednio w budynkach możliwe jest podniesienie stanu wiedzy w tej dziedzinie. Prowadzi to do wzrostu stopnia akceptacji rozwiązań zrównoważonych, stymuluje do prawidłowego ich użytkowania i obsługi oraz zachęca do powielania. W oparciu o analizę istniejących obiektów i modelowy projekt opracowano uniwersalne wytyczne projektowe dotyczące przedsięwzięć ekspozycyjnych, które opublikowano w dwujęzycznym kompendium pt. Educating Buildings.

*Słowa kluczowe: architektura zrównoważona, edukacja dla zrównoważonego rozwoju*

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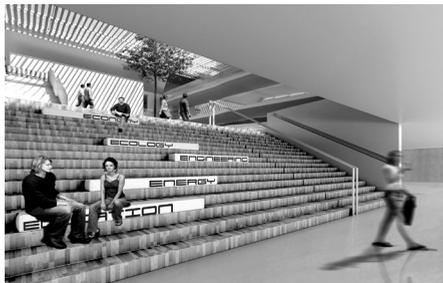
## 1. Introduction

Buildings, especially modern public buildings, are increasingly complex and technical structures. They contain, or rather they are constructed from, quite a number of cutting edge clever facilities and controlling installations. When one thinks of sustainable construction, these modern building systems play a central role. Their tasks as the key to sustainability consist however, not only of resource saving energy production and efficient energy use, but also increasing comfort for both the occupants of and visitors to a building. For this reason, it is important that they be understood, correctly used and operated.

## 2. The concept of a building as a self explanatory display piece

Detailed instructions booklets for buildings (like for every newly purchased gadget) would most likely be impossible to compose for highly complex buildings with all their components. When selected problem areas and solutions are concentrated on illustrating and explaining them in generally understandable terms within the context of the building itself, chances increase for occupants and visitors from outside the building to understand and through this, to competently use a building's varied technical possibilities. As a general rule, without such noticeable indicators and explanations, non-professionals are unable to access innovative environmentally technical measures installed in a building.

In this area, the large potential of possible knowledge communication stands opposite a considerable deficit of real, accessible explanations whereby at the same time, economic and ecological side-effects are more positive the higher the awareness for the complexities of the buildings are. In this way, buildings that educate can be used as an innovative and up to now unutilized element for informative learning. In this exceptional educational zone, learning takes place more or less incidentally during everyday use, to which however, in the context of educating about sustainable development, scientists have attested an ever greater importance.



III. 1. The concept of an educating building –  
3E building Wrocław, arch. P. Kuczia

The boundaries of informal learning are crossed when educating buildings are used for employee training or for working with classes of school children. What is understood is easier to accept. People's reactions to the built environment follow this principle in the following steps: recognition of the problem, understanding said problem and finally taking action.

A problem then, must first be recognized in order to be understood. Occasionally, people's attention must be enticed to the subject matter, which in turn must be explained in a suitable fashion, so that deeper awareness can be drawn achieving a desired level of understanding. With this understanding the acceptance of eventual limitations caused, grows. Acceptance also creates the necessary requirements for competent future use, in this case, for correct operation and use of a building's technical systems. This in turn positively influences user costs and environmental impact.

Awareness of issues involved in sustainable construction and the positive attitude created through understanding these issues can bring profitable multiplier effects: Some occupants may be future owners of buildings built to their requirements, while others may be educators. When these individuals transmit their positive insights about sustainable solutions, they can sensitize some to build according to the principles of sustainable construction and animate others to careful utilization of building technology.

For sustainable operation of buildings, energy efficient and resource saving heating, ventilation, cooling or lighting are indispensable. These technical systems are on the one hand forced by ever stricter legal codes and on the other hand, done on a voluntary basis leading to an increase in investment costs as a rule. In addition to this, restrictions or higher outlays are demanded of occupants while restrictions of decision making possibilities for building occupants can stand in the way of acceptance. In this case also, a better understanding of the measures for sustainability can, especially in the case of publicly owned structures, reduce opposition and create acceptance for corresponding expenses or minimal restrictions and increased expenditures. In effect, building owners, occupants and visitors will profit.



Ill. 2, 3. Exhibited real existing objects – IBA Dock Hamburg (photo P. Kuczia)

Unlike typical themed exhibitions, in which the contents to be exhibited must be acquired before further steps such as defining the core statement or the communicative goal can be considered, in the case of educating buildings the contents already exist and quite often real objects can be used. Here then, the task lies in exhibiting and explaining existing relationships, systems and solutions, which communicate their function and effect to occupants in an interesting and understandable way thus, steering attention to the underlying topic of sustainability.

### **3. Suitable Building Types**

Government bureaus and other state or municipal facilities with visitor intensive zones (municipal buildings, unemployment offices, visitor's centers) are excellently suited for display measures as well as kindergartens, waiting halls, and waiting zones in buildings of public transport, hospitals and other social or medical facilities, culture centers, food service, sport centers, airports, etc.

The well trafficked, public intensive areas of all of these structural objects are generally best suited to install information. In this way entrance halls, foyers or waiting areas where visitors can spend time or have to wait, where they are not forced to hurry and in passing, out of boredom or curiosity, can have a look at exhibits and explanations.

Along with public buildings, the measures can also be successfully used in private and commercial buildings, especially in industries whose areas of business are related to the themes introduced. In this way structures can effectively and profitably self advertise.

A special group of buildings are those whose specific purpose is education, training and the transmission of information in all fields of the subject matter of energy and building technology.

### **4. What can be displayed**

There are many sustainable measures and elements of the building which can be displayed and explained in educated buildings. Typical are the building materials, structures, functional solutions, technical building services, or even the constellation of the rooms.

### **5. Target groups**

In order to develop a conclusive concept with regard to display measures in differing buildings, it is initially necessary to designate the respective target groups. The more exactly the target groups are defined, the better the communicative content can be formulated and shaped, and the more effective and well targeted the exhibits become. To be considered are characteristics such as educational level, age, income, profession, social background or group affiliation.

The analyses help to define what information each group needs for each topic. Sporadic, as well as permanent occupants and visitors to a building belong to the typical target group. According to each object's function, these groups differ greatly; occasionally one and the same building has several groups of persons with deviating characteristics.

In schools, they include students, teachers and other educational professionals, technical personnel such as the maintenance supervisor as well as cleaning personnel, and of course the parents who are involved in school affairs or those who simply bring their children to school or take part in events offered in the school.

## 6. How to exhibit

This principle of clarity, simplicity and visibility should be followed for displays planned to exhibit the systems for sustainability in buildings. The message to be communicated by educating buildings should be as simple, graphic and comprehensible as possible. This takes place in several steps:

In the first step, the display in question attracts the attention of visitors or occupants so that they pause to satisfy their interest. The intended signal effect can be achieved through various methods: through light, color, contrast and unusual form. Additionally, atypical positioning or a change of perspective draws attention to the desired position. On the one hand, mounting displays at eye level is effective, but on the other however, explanations in surprising places (ceiling, floor, window panes, etc.) draw particular interest. It is also recommendable to place displays where individuals spend time anyway (i.e., outlandish, by grabbing attention using the space over the urinal in the toilet). The objects exhibited, along with their corresponding information, must be durable and long lasting.



III. 4. Exposed facade with photovoltaics –  
Plus-energy-house, arch. P. Kuczia

Formulate texts short and to the point, without unnecessary foreign words or technical terms. In order to assure understanding, a central order for texts, logically structured and properly outlined, should be formulated. References to everyday practice-oriented questions to introduce a topic, eye-catching key words and distinctive provocative expressions increase interest. Moving objects, subtly blinking lights, changing colors, quiet sporadically transmitted sounds (should not be irritating or bothersome!) and other similar measures draw the attention of passersby to a display. Audio material common in trade exhibitions should only be used in special cases, and even then more in the form of short interactive statements, rather than detailed explanations as for example, a talking trash can. An attractive option are surprising, movable and time controlled digital projections on objects of interest or near them (wall, ceiling or floor).

While the first step is to capture attention, in the second step the cognitive level of information transmission is reached. Here, content and core message can be transmitted through pictures, texts, audio-visual material, interactive computer programs or models. Ideally, the actual building or real objects should be used when possible. Real components of a building or detailed reproductions when exhibited, are more memorable than illustrations of them would be. Tactile anchoring can be strengthened when objects can be touched.



III. 5. Detailed reproduction of buildings walls – HBZ  
Münster (photo P. Kuczia)

Faced with the complexity involved in a number of the topics exhibited, reduction of most of the contents to their fundamental core message is unavoidable. In depth information does not have to be sacrificed entirely; however, further information can be offered in the form of additional material such as flyers, brochures, books or explanations on the internet. Additionally, further programs can be developed such as guided tours through the building or open house campaigns, depending of course on personnel and budget available. The use of computer based electronic media opens many additional possibilities to communicate.

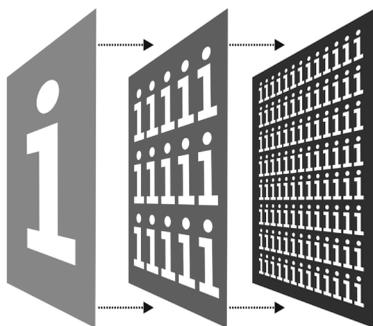
### **7. Target group adapted depth of information**

The target groups for the planned display measures are often difficult to define in advance. Thus, flexibility of composition and depth of information are therefore a necessity. This is only possible if the design approach allows for a certain amount of ‘multi-layeredness’ in the messages offered. Ideally, three levels of information can be offered:

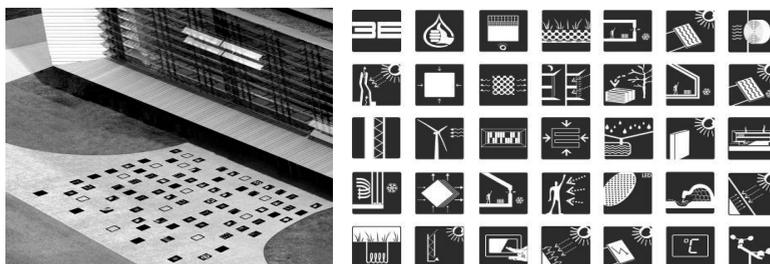
At the primary level the topic is defined and its solution shown. This simplest level is targeted towards groups of casual observers or non-experts who are drawn into the subject matter in passing, so to speak. Designers are well served to use a vivid, intuitively descriptive text and imagery characterized by short, simple expressions and sentences, as well as memorable, clear logos, symbols, and pictures.

The next level already begins to make further explanations available. As before, simple understandable forms of presentation are used; however now, the topic is explored in further depth explaining relationships and giving background information. The target audience here overlaps with that at the primary level in that displays appeal to those actively seeking further information on a topic without neglecting the coincidentally interested passers-by.

The third level of information transmission contains high content and further explanations aimed particularly at those familiar with the subject matter involved. As a rule, due to the extent of information involved, content is presented in electronic form to be called-up on screens on site or on the internet. QR-codes, offering fast access to desired links via smart phone or tablet PC, are a convenient and fast method of calling up information.



III. 6. Three levels of information (P. Kuczia)



III. 7, 8. Corporate design with recognizable logos, 3E building Wrocław, arch. P. Kuczia

Educating buildings depend on coherent, conclusive and adequate communication concepts. These are the basis for design of presentation measures about the sustainable aspects of a building. The communication concept serves as a guideline for all further implementation.

The communication concept must be translated into a unified, clearly understandable and recognizable image. The trick lies in finding the right balance between ‘eye-catching’ and ‘complementary/appropriate’. This is only possible through individual design attuned to the particular communication concept and the unique characteristics within a structure.

Ideally, corporate design for display measures should be developed during the planning phase of construction and can be included in corresponding interior design concepts, eventually involving existing master control systems. Information transmitting measures should not be haphazardly added, but rather harmonically integrated into existing surroundings. Requirements of differing target groups should be considered when developing graphic design for a building.

## 8. Conclusions

Modern, sustainable buildings of differing types can be turned into broadcasters of knowledge and thus become multipliers in the process of educating towards sustainable

development. Aspects of building technology can be placed into a context of ecological, economical, social and cultural relationships – set against a background of resource protecting and energy saving.

It is a completely new and innovative approach to informal learning in the context of the global principles of education for sustainable development.

Based on analyses of built examples and planning an innovative model building 3E for the University of Technology Wrocław, new concepts and project recommendations for exhibiting sustainable solutions and techniques have been developed. They are compiled in a bilingual compendium “Educating Buildings – Learning Sustainability Through Displayed Design”.

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