



An experimental new course bridges education, practice and research, enabling students in Berlin to put their ideas into practice in the transformation of a nineteenth-century school.

# The Baupiloten: building bridges between education, practice and research

Susanne Hofmann

## 1. Design unit

### Losing touch

With the exciting period of construction following German reunification now over, German post-war reconstruction has finally come to an end. For a brief period, reunification enlivened the building market with great visions, but now the demand for architecture and employment in the construction industry has sunk dramatically.

With the boom over, German professional architectural associations are turning their attention inwards and beginning to complain about the education at German faculties being too far removed from the practical necessities of the profession. Increasingly, architects are demanding that architectural courses at universities be reformed. There have also been suggestions to found a school of building where students can be trained for real life in order to be able to carry out the actual work of an architect. Such a school, it is argued, should devote more attention to real architecture than to fantasy projects, lost in dreams.

The Technical University of Berlin (TU Berlin) has been the centre of lively discussions about the future role of architecture in the curriculum. By and large, current architectural education is strongly polarised into two camps: those design courses that concentrate on conceptual, experimental architecture, or those which emphasise how to construct buildings without being concerned with architectural ideals.

This conflict is exactly where the Baupiloten take their cue: after many years in architectural institutes in both Germany and Britain, I have become convinced that education need not necessarily be separated from practice and research. I believe that a student can learn to develop strong architectural concepts while at the same time learning the skills needed to work as an architect. The Baupiloten are a group of students at the architectural faculty of the TU Berlin who carry out building projects under my guidance and supervision. My intention in founding the Baupiloten in June 2003 was to give fourth- and fifth-year architectural students practical experience

on architectural projects *and* to teach them the skills to develop and realise a design.

### Baupiloten: client, university, architect

I maintain a bilateral cooperation with the TU – as an architect and as a teacher. I acquire the projects personally for the Baupiloten and act as the responsible and personally liable architect. A client commissions me as the architect on a regular basis to meet a brief. I guarantee to deliver professional results.

This allows the students to have the unique chance to experience all the various building phases starting with design methods and concluding with cost control and site supervision. The Baupiloten learn how to develop and detail their design within a given budget and how to convince the client of the project through presentations and information, while displaying their competence and knowledge. Throughout the design process the students are able to consolidate their team project within all relevant disciplines, for example, technical subjects, CAD, building law and architectural sociology.

Through the Baupiloten I have come to realise that students enjoy the challenge of transforming their design into something tangible. The students work on such a project with an endurance, intensity and impartiality that can only be admired. In fact it is the students' lack of experience, reflected in a certain openness and naivety, continuous questioning, inquisitiveness and ambition, that very often lends wings to the project. The students become the main players. It is especially institutional clients such as schools that can profit immensely from the creative output of the students, as I will show later in the information about the refurbishment of the Erika Mann Elementary School.

In spring 2004, the TU Berlin chose to use the Baupiloten-course as part of *Studienreformprojekt* – the attempt to reform some of the teaching programme in the faculty. During the next two years I have been given the brief to establish a design studio which brings together theory and practice, which then – provided it is successful – should be integrated into the regular teaching programme.

<sup>1</sup> Second floor, Erika Mann Elementary School: 'The Throne on the Beat of the Wings'



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### Teaching goals

In German architectural faculties there is very little exchange between universities and professional experience. Design projects are usually developed abstractly and are rarely ever built. The architectural faculty at the TU Berlin aims to integrate the Baupiloten into their curriculum as a studio to bring life to projects and create an interface between academic and professional experience. The *Studienreformprojekt* is striving to achieve the following improvements in architectural education at the TU Berlin:

- Practice and research-oriented learning developed together with building projects;
- An understanding of the causal interdependences of design and the building process;
- The consolidation of design and technical, economical, legal and sociological support at the TU Berlin;
- The enhancement of motivation and responsibility through their integration within the realisation process;
- The testing of one's own ideas in the finished results.

Furthermore, I plan to survey to what degree assignments from the professional world can be more strongly reflected in an interdisciplinary way at the university.

### Teaching structure

The teaching is planned to enable students to develop a wide range of competences akin to those developed in an architectural office. These include:

- Promotion of social competence in a team: the students learn to develop their capacities for teamwork and communication, and their willingness to perform and enhance management skills by working together with fellow-students. They also learn to interact with clients, public authorities, craftsmen, manufacturers and building contractors.
- Learning professional competence for the individual building phases: the students take part in meetings with the client; learn to prepare and



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2 View into the hallways of the school before the refurbishment

3 Collage workshop with the pupils of the Erika Mann Elementary School

4 One of the pupils' collages: The Hot Garden

5 Explicit and sensuous vocabulary of the pupils describing their imaginary worlds

give presentations and perform at and lead meetings; discover how to develop their design; learn about detailing and cost through dealing with firms and external advisers. At the same time I teach them methods by which they can develop and reflect their project at the different design stages.

The work of the Baupiloten is always results-oriented and subject to deadlines. Projects are supported through both an internal university network and a range of external visits and contacts. I coordinate the project with other teaching staff of the TU in order to incorporate other subjects into the work, and during the design process we visit building sites, exemplary projects and architectural offices. Experts from the professional world are invited to be involved as critics and advisors, and external firms are often attracted by the students' openness and potential, and generously offer their know-how. The students' work is also research-oriented, and they are required to step outside the academic world and take into consideration the views of the client, customer or advisor. The ideal case-scenario is an enriching exchange between fiction and reality.

**Teaching on demand**

German universities are currently restructuring their teaching modules according to the Bachelor and Masters programme, with the aim of achieving international compatibility. The Baupiloten will be integrated as a module into the Masters course of study at the TU Berlin, and I expect the students to take work in the project for at least one semester of six months. In order to gain experience in more building phases, students are recommended to stay for two semesters, and they receive correspondingly more credits.

Throughout the design process, the students can consolidate their team project in all relevant disciplines taught at the TU Berlin. Instead of learning about building law, fire protection requirements, light engineering, building services, principles of quantity surveying and structural engineering detached from any context, the Baupiloten are taught these subjects on demand, when and as they are needed. They can also get support in CAD or reflect social aspects of the project in a thesis on architectural sociology. The Baupiloten

get their credits according to the requirements of the respective subjects. This synthesis responds to the manifold collaborations in the professional life of an architect, and in a future process of structuring the module of the Baupiloten I aim to acquire an even broader interdisciplinary exchange with the possibility of working with various universities outside Germany.

**Design packages**

Projects are usually started by asking the students to work out parallel designs. After a few weeks we scrutinise the different ideas to decide which concept or aspects we can distil from the various alternatives in order to develop them further. The students would then work out some versions they need to discuss and decide which concept to follow. As soon as they have reached the point where they have developed a project of which they are convinced, I start to divide it into different packages. Thereafter, each student takes on a design package he or she can work on creatively and develop as far as possible independently. The danger, of course, lies in the students falling in love with their own idea and overloading the single, shared package with too much design. Here I take on the role of a mediator motivating the students to continue considering the overriding main concept.

The interweaving and resulting co-ordination among the students are obviously immense on such a small-scale project. The advantage, however, is that the students can experience rewarding results in the short period of one semester. The balance between the size and number of design packages is also judged so that they are sufficiently challenging and at the same time comprehensible for the students.

In addition to the subdivision into separate packages, projects are also differentiated according to planning stages which might – depending on the size of project – be spread over several semesters. The working schedule of the Baupiloten is adjusted to deadlines which are specific to the particular project. In order to handle the work professionally and to remain in close touch with reality, I aim to time the projects to fit neatly into the academic year. The potential of integrating a particular schedule into the academic year is examined as part of the *Studienreformprojekt*.



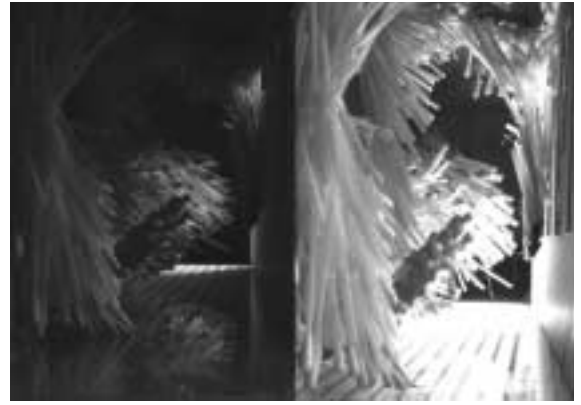
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## 2. Design – a form of research

The Baupiloten's aims are to create socially engaged architecture, to be experimental in content and method, and to deliver a sensuous architecture. They take the users' desires and the invisible-visible spirit of the place to develop a tangible architecture, which aims to be a social catalyst facilitating communication and group interaction. The rehabilitation of the Erika Mann Elementary School reveals the all-embracing process and high ambitions of the Baupiloten to create an architecture that is socially engaged, experimental and sensuous.



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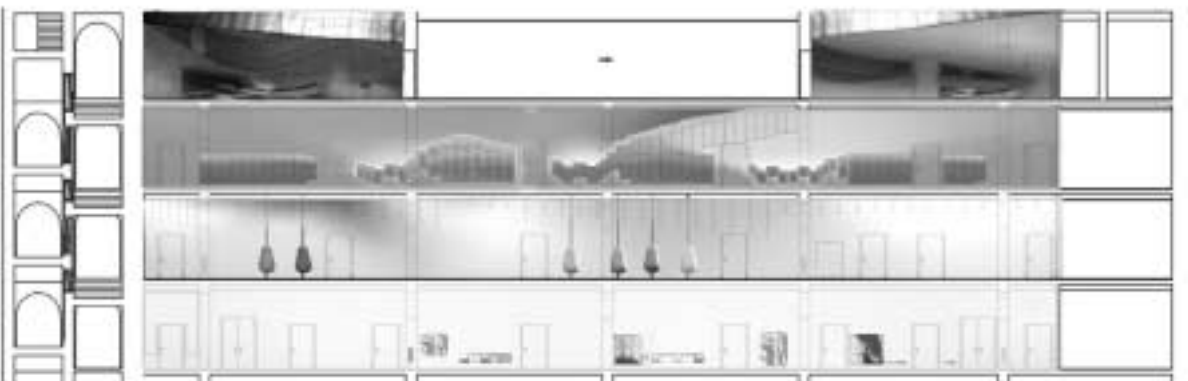
**Socially-engaged architecture**

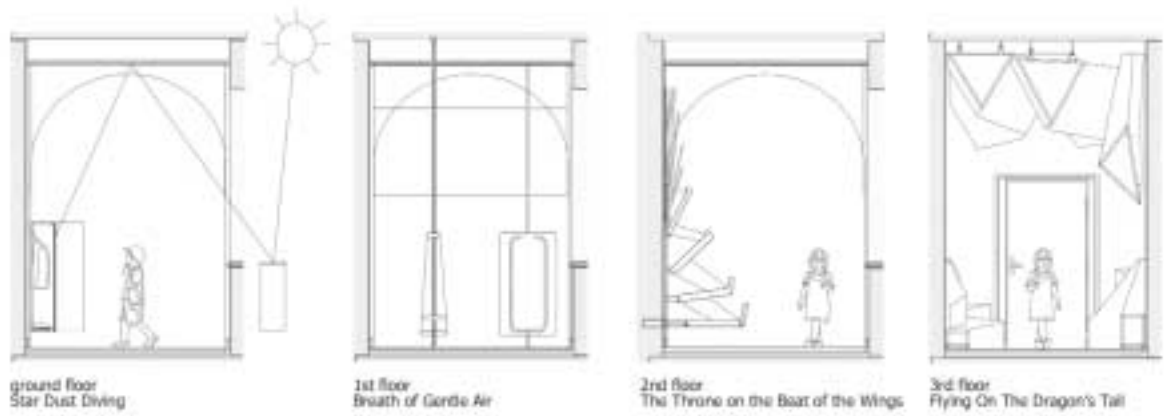
The Erika Mann Elementary School is situated in Berlin-Wedding in the middle of a socially deprived area: the unemployment rate is more than 50%; moreover, 72% of the inhabitants lack either further education or vocational training, while 18% have no school-leaving qualifications. At the Erika Mann Elementary School, 79% of the pupils come from a non-German-speaking background, the 400 children having their cultural backgrounds in 25 different nations. Most of the children's parents have little formal education, and 66% live below the poverty level. In the worldwide educational study, PISA, these children have been shown to be suffering from underachievement. This unacceptable situation has led to an intensive school renovation programme supported by the 'Socially Integrative City' programme. The latter, designed to help neglected neighbourhoods, was established in 1999 under a Federal-Länder programme entitled 'Districts With Special Development Needs - The Socially Integrative City'.

Neighbourhood management plays a key role in the programme: all experience has shown that without effective neighbourhood management and appropriate administrative and political structures, the local government and the citizenry would fall back into their old roles of service supplier and user, preventing a lasting, self-sustained reversal of the difficult developments in disadvantaged urban areas.



- 6 Baupiloten collage: 'The Dragon being awake'
- 7 Baupiloten collage: 'The Silver Dragon' at night and morning
- 8 Baupiloten collage: 'Flying with the Dragon'
- 9 Pupils testing prototypes: 'Stardust Diving'
- 10 Pupils as our guest critics
- 11 Students and children at the Baupiloten office at the TU Berlin
- 12 Exterior view of the Erika Mann Elementary School
- 13 Long section showing the Silver Dragon in the four hallways





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14 Cross sections of the hallways

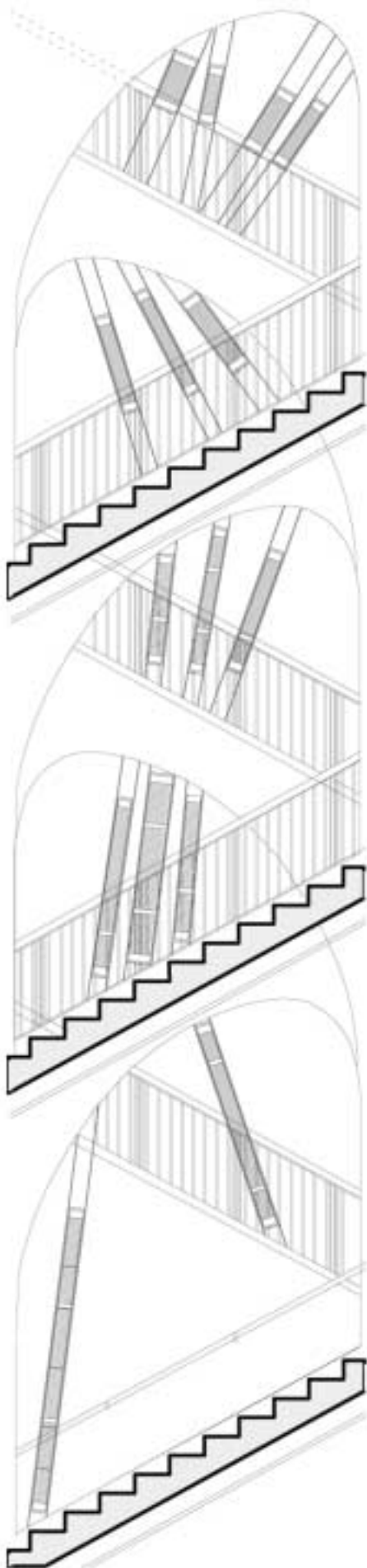
15 Seating benches on 'The Dragon's Tail'

16 Baupiloten and craftsmen installing a dragon tail on the third floor

17 Section through the main staircase with the 'Giant Humming Trail' musical trail up the stairwell to the sky



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The neighbourhood management of Wedding contacted the architectural faculty of the Technical University of Berlin requesting students to be involved in enlivening the architecture of the Erika Mann Elementary School. The old school building by Ludwig Hoffmann, a typical product of spartan Prussian architecture, exudes a daunting authority. The building is characterized by wide, long, rather drab hallways and staircases intended to serve as an environment for learning and well-being [2].

I met the head of school and encouraged her to open up the school through an architectural concept strong enough to improve the quality of communal life in the neighbourhood. The refurbishment should help the pupils to overcome linguistic and cultural barriers, and at the same time is planned to integrate the school into the community as an educational centre for all inhabitants of the district. The school could become a place of identification and support, as well as of multi-cultural communication.

There is usually money at the disposal of a 'civic forum' in the district concerned to support effective social projects. Following the enthusiastic reception by the school community and the neighbourhood management in Berlin-Wedding for the imaginary landscape the students had developed, the civic forum decided to sponsor the endeavour with the lump sum of €128,000 – convinced that the spirit and energy of the architecture would infuse the whole neighbourhood. The Baupiloten decided to give the feeling of *Heimat* to the neighbourhood.

### Experimental architecture

#### 1. Creative participatory work

The school Principal was open to an experimental architectural approach and had the specific desire to have wardrobe and seating furniture integrated into the plan, which should create a flexible and stimulating space for many small groups of pupils. We suggested involving the pupils in the design by taking their desires seriously. She loved the idea and we started off with our first collage workshop [3].

I started this ambitious project as a design studio with 11 students, who brought materials for a group of around 20 third- to sixth-grade pupils to make paper collages. The set topic was, 'The path through the garden of the future', and as a result they invented fantastic (in the true sense of the word) unseen worlds, to which they gave names such as 'The Hot Garden' [4], 'The Garden of Traces' and 'The Most Colourful Garden'.

Listening to the pupils describing their imaginary landscape with a very evocative and sensuous vocabulary was inspiring, and in their thoughts they led us through an airy, golden, icy, soft, cushioned, fluffy, feathery, furry, cuddly, tight, bright, dreary, wispy, stretchy, prickly world – viz the complete collection of children's words [5]. This showed clearly that children with fewer qualifying experiences and reminiscences are much freer, more powerful, direct and immediate in their reactions. The young children communicated their work at an emotional level, blurring the boundaries between reality and fantasy.







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18-19 'Silver Dragon Worlds'



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From these vivid expressions of desires and imagination the Baupiloten developed first, the qualities of perception, and then a sensuous, expressive architecture [6, 7]. They experimented with ephemeral materials such as light, air and heat to lend a playful lightness to the severity of the authoritarian school building. The students explored the pupils' imaginary landscapes in more specific spatial photomontages [8], then developed their ideas into models and finally built a prototype [9]. Every few weeks the students presented their work to the schoolchildren [10] who were surprisingly articulate in expressing what they liked and what they did not like. They longed for an architecture which glows, resonates, alters and 'lives' somehow [11].

By the end of the summer semester, the students had developed the concept and architecture for the transformation of the school, which followed the fictional world of the 'silver dragon':

*A silver dragon approaches the school in search of a sleeping place. He wanders through the hallways of the first, the second and finally the third floors. Everywhere where the dragon has been, the hallways have changed. At the beginning you see a flicker and a glimmer, as if the twinkling scales of the dragon's skin have rubbed off, but more and more the school turns into an enchanted dragon den [12, 13].*

## 2. Network of implementation

Five students decided to develop the project through to completion. From then on – under my supervision – each student took the responsibility to transform a hallway or a staircase. Strict rules concerning the children's security, fire protection and the preservation of the historical building had to be

taken into consideration [14]. The total floor space of the circulation area was 1107m<sup>2</sup>. In an intensive process that allowed for trial and error, I encouraged the Baupiloten to reach the final design with innumerable models and photomontages. Finally, the students developed all the details in exchange with the internal network at the architectural faculty as described earlier.

For some units, the students could develop their project directly with external skilled workers; in other, extraordinary collaborations with penal institutions we had, however, to rely on our internal knowledge. Cooperative arrangements with various institutions that support the social integration of fringe groups had been established on earlier projects, and a large part of the actual work was carried out by prisoner craft workshops and by companies that specialise in training disadvantaged young people.

Most of the furniture was produced by inmates in the workshops of Germany's largest penal institution in Berlin-Tegel. The metal workshop built the wardrobes, expandable seating and table furniture of the ground floor, and the structures of the textile wardrobes on the first floor. Upholsterers sewed the glass and metal textiles of the first floor wardrobes, while female inmates sewed the glass silk veils. These workshops did not have the funds to consult with us, and after gaining an understanding of what they are actually capable of producing, the Baupiloten took the challenge to work out all final detail drawings and instructed the prisoners. Institutions that help men with psychic disorders produced the rather complicated wardrobes on the second floor. They supported us greatly in developing the specific way





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20 Ground floor: 'Star Dust Diving'

21 First floor: 'Breath of Gentle Air'

22 Third floor: 'Flying on the Dragon's Tail'

23 Main staircase: 'Giant Humming Trail'

24 Pupils playing the harps of the Giant Humming Trail at the celebratory opening





25 Current Baupiloten project: the kindergarten named 'Tree of Dreams' in Berlin Kreuzberg

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of opening which reminds the viewer of the movement of a wing.

Working with handicapped women, the Baupiloten sewed the textile skin of the dragon tails of the third floor. Socially disadvantaged youths manufactured other individual parts of the project. One group of young metal apprentices built the brilliant and complicated metal seating benches of the third floor [15]. Young painters took care of all paintwork. Only the unfolding seating landscape on the second floor and most of the curved metal structure on the third floor were built by a 'normal' metal workshop [16]. The musical instrument-maker Bernhard Deutz developed the musical trail the Baupiloten conceived for one staircase. This consists of 16 harps of different length that the school integrates in their music lessons, and the instruments were again built and lacquered by the inmates of Tegel prison [17].

To enhance the identification of the neighbourhood with the school we offered the schoolchildren, parents and other interested people of the area a multitude of ways to get involved in the process. Parents and teachers carried out simple technical work under the students' instructions; some fathers hung the 135 picture frames of the gallery band on the wall of the secondary staircase; teachers hung the 114 veils from the ceiling in the first floor, while their colleagues enjoyed themselves by dressing the textile wardrobes.

The project has been praised by the Berlin city council as an exemplary model of cooperation between diverse protagonists in the neighbourhood. The resulting architecture was only possible through our extensive network and the never-ending energy and ambition of the students. The strong creative participatory work and continuous exchange with the pupils made the refurbishment an extraordinary assignment.

## Sensuous

The imaginary landscape of the Silver Dragon serves as the basis of an expressive and playful architecture: the further you get into the school building, the stronger you feel the spirit of the Silver Dragon – a spirit which alters, resonates, glows and shimmers. The architecture outlines the different presences of the imaginary dragon at the individual floors [18, 19]:

- Ground floor: **Star Dust Diving**. Above the yellow-green lacquered expandable metal furniture grow plants under a permanent violet light, which offer the dragon his sleeping place [20]
- First Floor: **Breath of Gentle Air**. Between the light translucent veils of the ceiling and the shimmering textile wardrobes the breath of the dragon becomes perceptible [21]
- Second floor: **The Throne on the Beat of the Wings**. Protected in the crook of the dragon's wings, groups of small children read, work and discuss together [1]
- Third Floor: **Flying on the Dragon's Tail**. Between glowing and reflective dragon tails, small study groups engage in discourse [22]
- Main staircase: **Giant Humming Trail**. The dragon dances and jumps along a musical trail up the stairwell to the sky [23]
- Secondary staircase: The **image gallery band** presents the work of the schoolchildren. The

integrated wardrobe and seating furniture create a flexible and stimulating space for small groups of pupils.

A recent evaluation of the school shows that the Silver Dragon world sparks the children's imaginations, and I like to interpret the enthusiastic acceptance of the school's transformation as a demonstration that architecture can perfectly well act as a social catalyst [24]. The pupils and their desires were taken seriously, and their decisions were respected. The school became *their* school, a place they could identify with. It became their place of identification and support in a socially difficult district.

The refurbishment of the Erika Mann Elementary School shows most comprehensively the work of the Baupiloten [25]. The students of the TU Berlin are keen to join the group, and hope as a consequence to have a better chance to find work as an architect from this experimental course, which bridges education, practice and research. The fact that the work at the Erika Mann Elementary School received the Socially Integrative City Award 2004 and an honourable mention in the ar+d Emerging Architecture competition run by *The Architectural Review* encourages me enormously in pursuing the idea of the Baupiloten.

## Illustration credits

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Achim and Merwe, 4  
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Participants from the socially responsible economy:  
 Union Sozialer Einrichtungen GmbH (employment organisation for disabled people)  
 Correctional facilities in Tegel (for men) and in Lichtenberg (for women), including workshops in metal construction, tailoring, painting, furniture cushioning  
 Labora (vocational training and employment promotion for young people)  
 Various other youth training centres

Architectural Association in London where she was nominated for the RIBA Silver Medal in 1992. She has worked for Alsop & Störmer Architects, Sauerbruch Hutton architects in London and Berlin and for Gerhard Spangenberg in Berlin. Since 1997 Susanne has been teaching in London, Berlin and Hamburg. In June 2003 she founded the Baupiloten in cooperation with the TU Berlin and has carried out several projects including a central lecture hall for the FU Berlin and the transformation of a school and kindergarten. The first Baupiloten project, the refurbishment of the Erika-Mann-Elementary School in Berlin, received the Prize of the Soziale Stadt and an honourable mention at the ar+d Emerging Architecture Awards. Her work has been exhibited in Rotterdam, London, Hamburg, Berlin and Buenos Aires and published widely.

## Project credits

Baupiloten (Erika Mann Elementary School):  
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## Biography

Susanne Hofmann studied at the Technical University and the Academy of Fine Arts in Munich and with a DAAD scholarship at the

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