Invention, Maintenance and Renewal of Urban Educational Facilities

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FEATURE

INVENTION, MAINTENANCE AND RENEWAL OF URBAN EDUCATIONAL FACILITIES

PEB co-hosted a symposium entitled “Invention, Maintenance, and Renewal of Urban Educational Facilities: Global Challenges and Community Solutions” with the American Institute of Architects’ Committee on Architecture for Education and the CEFPI Urban Education Facilities NE Chapter in October 1999. The meeting aimed to provide arguments and evidence for system managers seeking to secure resources for maintenance as well as to sharpen their abilities to use those resources well. Over 60 architects, facilities planners, school officials and governmental resource providers representing 11 countries gathered in Baltimore, Maryland (USA) to discuss the design and condition of school buildings, and their capacity to respond to changing educational demands. Below are excerpts from the symposium papers, including keynote presentations and workshop reports.

Improving the Effectiveness of Educational Facilities, a workshop report by Jean Drouin, Canada

Managers, faced with a perpetually changing environment, scarce financial resources, ageing premises, collective agreements governing the working conditions of teachers and other staff, environmental and energy-efficiency concerns, shrinking or on the contrary soaring enrolment, urban sprawl, new technologies and recent pedagogical changes, are obliged nevertheless to meet immediate and future student needs. To do this, they are having to revamp existing schools and re-design new facilities.

Advantages and drawbacks of existing facilities

Existing school buildings are old and in need of maintenance. In highly urbanised environments, it is inconceivable that they will all be renovated, given how numerous and dilapidated they are and hence the cost involved. Furthermore, lack of available space makes extension difficult. Yet older facilities have their importance, both symbolically and architecturally. They create not only a feeling of belonging but also an image that remain in the minds of all former students.

Lack of space may sometimes be more a problem of space management, which can be solved by rearranging timetables to suit the number of students, the functional aspects of the premises and user requirements. Sound timetable management can prevent schools being overcrowded at certain times and lying empty at others.

Methods of assessment

Most assessments of the effectiveness of educational facilities focus on the physical aspects of the building and on student achievement. It is widely acknowledged that colours, lighting and acoustics play an important part in the learning process, but it is hard to quantify the direct effects. These assessments are often contested, since the inclusion of criteria such as teaching-staff quality and user satisfaction can lead to contradictory findings.

Carmi Bee, a New York architect, reminded the symposium that thirty years ago there was already talk of assessing facilities with a post-occupancy evaluation focusing on student achievement, satisfaction and social behaviour and on the “human” side of school premises. In his view, architects did not help or influence users sufficiently. Post-occupancy evaluation of educational facilities should take into account the users’ comments, attitudes and moods. And cultural differences affect the way we interpret our environment.

Once people have moved into a building, adjustments are mainly a question of engineering. For temperature, lighting and air quality, controls and adjustments that are familiar to and readily understood by users are built in at the design stage.

New information and communication technologies

With regard to new technologies, computing and new information technologies such as the Internet have certainly spread rapidly throughout education, but there is much uncertainty as to their impact and how best to handle their introduction.

There is very high demand for teleconference rooms, computer labs and Internet connections. Several building projects are being undertaken with temporary cabling until wireless communications have developed further. However, nobody knows whether this is the right solution and whether wireless buildings will really be more commonplace in a decade’s time.

New technologies are increasingly important in schools and sharing is encouraged. Mary Dietz, a New Jersey architect, demonstrated this in the project to renovate Wadleigh School. Built in 1904 to house 1 500 secondary students, the premises have been converted to house 1 040 students in four schools (art,
literature, science/technology and media/technology). However, the four separate schools share a single multi-media centre.

In order to ensure that a school’s ICT project is a success, it is crucial for all the stakeholders to be involved, i.e. teachers, parents, students, administrators and politicians. Mary Dietz stressed that, if handled well, computing as a teaching tool can develop children’s independence, ability to work with others, creativity, commitment, self-esteem and decision-making faculties.

The new information technologies will not replace teachers. Children need interpersonal contact if they are to learn. Constant reminders are needed that information technologies are not goals per se but tools that can serve to facilitate learning. As such they are excellent, though some concerns remain.

**Solutions**

The most important key to successful school design is the programme. It specifies the number of students and identifies necessary building work, surface areas, service requirements and optimal use. All this requires teamwork. Regardless of whether teachers, professionals, administrators or politicians want to enhance the effectiveness of school facilities, they cannot do it alone. They must work with their peers, management, students and parents.

In most cases, designers can identify solutions to architectural problems and eliminate them. Politicians and administrators, however, have their own agenda which in many cases means building new schools rather than renovating old buildings.

Flexibility and adaptability are required when seeking solutions. Education is perpetually evolving, particularly with the advent of new information and communication technology and pedagogical developments.

We need places where children learn to live, want to learn and feel safe. School is a gathering place. Its symbolic dimension must not be overlooked. Students have a strong sense of belonging, years after they have left school.

There is no consensus on optimal class numbers. For some, there is an irreversible trend towards small schools. The ideal school is small, with a family atmosphere. And yet the smaller the school, the less variety it can offer in terms of the curriculum and other activities.

Regardless of the purpose a building must serve, the human aspect remains important. Designers should create an environment that is conducive to learning. They should choose colours meticulously and pay close attention to acoustics and lighting. Areas should be designed to be welcoming and comfortable, stimulating or calm.

Nevertheless, when people move into renovated or new premises, they need help to make the best possible use of the facilities. Otherwise they will stick to their old habits, and fail to understand functional aspects or the full potential of the designer’s changes and innovations.

The post-occupancy period is just as important. We should question those who represent teachers, students and administrators on what they find pleasant or disappointing and what they consider to be improvements on the previous situation.
Managing Educational Facilities
Infrastructure, a workshop presentation
by Manfred Hinum, Austria

Many countries, regions and communities are becoming extremely concerned about issues such as the maintenance of ageing stock, vandalism, the reuse and adaptation of buildings, up-to-date furniture and equipment, the use of premises for more than one purpose and the reduction of premises, as well as related expenditure. In many cases, however, even the basic information necessary for effective management is lacking.

The influence of facilities

As witnessed at an international seminar in Austria in 1998 on “Improving the Quality of Educational Building”, the conviction is strengthening that the quality of facilities has an impact not only on educational outcomes but on the well-being of students and teachers. There is a growing awareness of the role that educational facilities play in shaping attitudes toward the environment and the contribution they make to urban renewal.

Glen J. Earthman of the Virginia Polytechnic Institute and State University, USA, reported at the Austrian seminar that studies have demonstrated a relationship between student achievement and behaviour and the condition of the built environment. Some of the most important factors that influence learning and living are those that relate to control of the thermal environment, proper illumination, adequate space and furnishings. If, as studies and experience strongly indicate, achievement (i.e. student test scores) is greater in above-standard schools than in substandard buildings, it is the obligation of the responsible authorities to improve the facilities.

The quality and duration of a building are affected by how it is looked after, the ways in which servicing and repairs are carried out, and the rate at which needs and requirements change. Therefore it is necessary to develop strategies for managing educational facilities but also to do research to better understand how facilities influence student behaviour and achievement.

Maintenance

A marked deterioration in the condition of facilities and in the morale of facility-users is one of the main problems experienced. Insufficient funds, poor management of funds, and estate management and provision that do not match educational needs contribute to the “maintenance gap”.

Poor maintenance increases running costs, such as for energy and cleaning. Energy expenditure, for example,
can amount to more than one third of premises-related expenditure; reducing energy consumption can help not only to save money but also to reduce carbon dioxide emissions and other forms of pollution. Further consequences of poor maintenance are deterioration of parts of the building; an unsafe and unhealthy environment; vandalism; and a lower quality of teaching, learning and living.

On the other hand there are educational, social and environmental advantages of good maintenance. The condition of the environment indicates society’s support for education. It sets an example to pupils, that the environment in which we live should be cared for. Good maintenance promotes the aims of education.

Steps towards keeping schools in good and up-to-date condition include:

- Have accurate information about the condition of the facilities and the scale of funds needed. Keep the condition of the building stock and resources under regular review.
- Define priorities for expenditure.
- Ensure financing by convincing authorities and other key people.
- Establish resource and funding allocation mechanisms.
- Stick to planned maintenance schedules.
- Act promptly to repair damage.
- Give responsibility for the condition of the facilities to people who are close to the facilities concerned.
- Involve the users in the management.

Most of England’s school buildings are now at or past the end of their design life, only a relatively small proportion are modern. School inspectors consider that one in five schools have unsatisfactory accommodation. The poor condition of many buildings is partly due to past under-funding, but the system for handling capital has also had many perverse incentives within it.

In May 1997, a new Labour Government was elected and announced its priorities as being “Education, education, education”. The government, recognising that to improve standards it needs to modernise school buildings – which will also prepare the way for greater ICT based education – has made more money available for schools and education generally. Over a four year period, over GBP 6 billion will be spent on capital building works at schools.

The large inflow of extra capital has set many new challenges, and government innovations have focused on three main areas:

- how to target money more effectively to raise standards;
- the need for better delivery mechanisms to improve value for money and the stewardship of school premises;
- how to evaluate capital spending.

### Better Targeting

The condition of schools varies widely and there are also huge differences between Local Education Authorities (LEAs). So how can one make sure the money goes where it is most needed and where it will have the biggest effect on standards?

The traditional method in England has been to invite bids for individual projects. But this approach generates much wasted effort. In 1998, LEAs and schools bid for six times more money than the Department for Education and Employment (DfEE) had available. It also involved those sitting in the ivory tower in London making decisions on local priorities. The government wants to move away from this approach to one in which LEAs and schools have greater ownership and assess their priorities locally on a proper basis.

The vehicle for doing this is Asset Management Plans (AMPs). AMPs are essentially a framework for assessing capital needs and agreeing priorities locally in a robust, fair and improved way, and in a spirit of
good partnership and collaboration. Capital requirements will be assessed for three main types of need: condition, suitability as related to the curriculum, and sufficiency – the number of schools and total areas available.

**Delivery of capital**

To respond to the challenge of putting money where it will be most effective, the DfEE developed a new capital strategy. Its first key components are AMP appraisal and formula capital allocations to LEAs for condition works at schools. This is very much on the principle of “intervention in inverse proportion to success”. If an AMP is appraised as being sound – with good collaboration across all schools in prioritising need, value for money in the proposed solutions and a track record of good maintenance – the government will make a big formulaic allocation of capital to the LEA and leave it to get on with managing its capital programme. The other side of the coin is that it will bypass the LEA and provide grants direct to those schools where it considers investment is needed if the local processes are shown to be weak. And, from 2002/03, the government will start to make capital allocations with a “discretionary” element – initially only 5% – but enabling it to reward Authorities by giving them extra money for good asset management.

Since April 2000, England is also providing an annual ring-fenced allocation of capital direct to all schools – typically around GBP 25,000, although the amount is likely to get much bigger in future years. This gives schools the ability to direct capital funds to those areas which they regard as high priority and, for bigger projects, to enter into a real partnership with their LEA, based on their own, tangible stake. Clearly, the dynamics are changing, with schools having much greater ownership and influence. Another innovation is the use of Seed Challenge funding where the government is making available to each LEA seed money which can be used by schools to help lever in money from the private sector (such as from sports or arts bodies) for important but lower priority work. Public private partnerships are being pursued as well. Already 550 schools in England are benefiting from large private finance deals, with many more in the pipeline. Public private partnerships are becoming the preferred method of procurement, subject to satisfactory value for money checks and transfers of risk.

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**Evaluation**

There is clearly an assumption that investment in schools has a positive impact on pupil performance. The DfEE recently commissioned PricewaterhouseCoopers to carry out a study to test the assumption about this link. The aim of the project was “to measure the additional effect, in terms of pupil attainment, of every GBP 1 invested in schools capital”. The study is attempting to
were: from around the world and the preliminary findings were:

- The evidence linking capital expenditure to school performance is mixed (some studies find positive relationships, some negative, some no relationships at all!).
- There is broad acceptance that capital expenditure can have an effect on performance (particularly when starting from a low level of initial capital – for example, in developing countries or, for advanced economies, more strongly in the earlier part of this century than in more recent decades).
- The general ambiguity in findings can probably be related, at least in part, to how the work was specified and carried out – the nature of the studies, and the qualitative and methodological differences.

The consultants have also developed a conceptual model to illustrate how capital investment works its way through into educational attainment, and have listed a whole range of inputs and intermediate outputs. Whilst it may be possible with some confidence to identify the impact of capital investment on the intermediate outputs – such as improved teacher recruitment and retention, or better staying on rates or reduced truancy – it is of course extremely challenging to identify the impact of capital investment alone on the final output of attainment levels.

A large number of structured interviews have taken place with a representative sample of individual schools and headteachers to help prove the model, and a whole load of data is currently being assembled and interrogated to try and measure the link.

The study has already identified strong links between capital investment and performance. For example, capital investment was seen by headteachers as being one of the two most powerful levers on teacher motivation which, in turn, links directly to the quality and amount of teaching, before feeding through into the quality of learning and pupil performance. There were also strong correlations between a high quality learning environment and good teaching, leadership, attitudes and behaviours. Expenditure on such areas as heating, air quality and lighting was a particularly strong influence on performance.

\[\text{The Impact of Education Trends on School Facility Designs, a keynote speech by Prakash Nair, United States}\]

There is a great divide between the current thinking in the educational community and the work that school facility professionals are producing. Most of the older stock of existing buildings and newly built school facilities inhibit the proper delivery of education. The uniformity of school facilities is suited to the outdated one-size-fits-all approach to education which does not consider that: "The ways children learn and develop are highly individual – even idiosyncratic – and the attempt to have them learn the same things in the same way at the same pace is a form of educational folly" (Scott Thompson).

Certain questions are not asked often enough:

- Architects: Should the focus be on creating better buildings or better students?
- Politicians, educators and administrators: Should the focus be on achieving higher test scores or creating better students?
- Parents: Should school simply focus on academics or seek to develop responsible citizens?

The most important function of a school may not be to deliver academic education in the traditional sense, but to provide social skills for survival in the adult world. To survive and thrive in the next century, children will need proficiency in many types of literacy, not only academic but autonomous, community, family, workplace, etc. Learning is not about simply understanding the subject or even retention; learning is about engagement. Once children are engaged in a task, they become partners, collaborators, and even teachers. As expressed by Chip Wood, co-creator of the "Responsive Classroom" approach to school reform: "If the focus were really on creating better students, children would have time in school to consider and reflect on what they were learning and time to care about and contribute to one another and their school. They would have time to ponder where their lives were headed. School would be a learning community, not a fact factory."

One must be careful of the information-rich/experience-poor paradigm. Technology is a tremendous tool, but it cannot compensate for real life experiences. Schools should get children out into the community, in supervised settings such as after-school programmes, doing volunteer work, gaining skills, e.g. visiting the elderly, taking care of animals at animal shelters, reclaiming patches of land through neighbourhood gardens. The opportunities for children's involvement in the community are endless.
If school can be conducted in the outside community, so too can the outside community come into the school. “Classrooms organised as theatres, a newspaper, art galleries, stores and post offices provide opportunities for acquiring literacy skills by simulating situations that make sense in children’s everyday life” (Carol Walker and Frank Yekovich).

One should keep in mind that schools in poorer districts need more services and that older buildings need more money. Poorer districts should get a larger allocation of public money because they are less likely to attract private money.

When it comes to the future of schools, the school planning and design community can no longer afford to be bit players on the sidelines. Facility professionals need to assume leadership roles in shaping both the present and future of schools, not school buildings.

Planning for the Future of Education, a keynote speech by John Mayfield, Australia

What will education be like in the future?

In the future, everyone will be a learner all their lives. The educational service must respond to everyone, not only but certainly including the young. Education will enable individuals to live full and fulfilling lives. It will be essential for the development of the community and for economic development, including the development of education as a service industry in its own right.

Powerful new learning technologies will be available alongside conventional teaching technologies. Education will be a traded service as well as a free, public, compulsory and secular service. The content, accreditation and assessment of learning will be more national and international in outlook. Education will take place in the home, workplace and institutions. It will take place anywhere, anytime and on demand.

Education will be much more learner centred. Teachers will remain essential and will do increasingly different things.

New partnerships will be crucial for the educational service to be appropriate to the special, immediate and future needs of the learners. Education will no longer be a monopoly. Co-operation, collaboration and partnership are necessary for maintaining, inventing and renewing the educational service, including the places in which people (especially children) learn.

Communities will need to meet these five needs:

- reintegration of the functions of the urban environment: live, learn, work and play;
- the opportunity for accessing, processing and publishing their own new knowledge;
- a set of learning services including advice, brokerage and assurance, but also a responsive local public learning service;
- a process for continuous improvement;
- connection and partnerships with other communities.

Recommendations for facility planners

- Work with others: Identify the school as one part (perhaps the focus) of the lifelong learning service. Recognise the links between education and economic development. Recognise the importance of inclusion – everyone will be involved all their lives.
• Develop a signature: Identify a speciality as a point of difference. Build on existing strengths. Recognise how to operate in a global community without losing the sense of being special or unique. Develop a way of contributing to the network.

• Master the technologies: Maximise the use of the new information and communication technologies. Establish some form of an ICT centre. Work with every partner that can be found. Link with others of the same speciality. Access, process and publish.

• Contribute to the social process of learning: Create a facility in which people can engage in social processes. Recognise the purpose of technology.

• Aim for sustainability: Education is both a public investment and a traded service. Think of the educational service as a business. Develop a business plan. Identify and quantify the tangible contributions of the educational service to the economy of the community.

• Ensure that the range and nature of fixed assets are responsive to inevitable and rapid change: Facilities are now more likely to be dispersed, leased, shared, part of the urban fabric and open all hours. They are likely to include the home and the workplace. They should still be architecturally recognisable.

• Set up the process of continuing improvement: The aim is for education to contribute to making the community a better place in which to live; the aim is not simply a better school.

• Invent, re-engineer, create: Try to work out why the plant is rundown, unloved and not working. Identify (with all those concerned) what has changed. The argument for reform is stronger today because there is an acute sense of need for lifelong learning, the technology is available, the models are emerging and the resources are available.

The symposium papers presented here are available in full in the Resources section of the PEB Web site: http://www.oecd.org/els/edu/peb/

Over hundred years old primary school in the United Kingdom

References


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