Reality checking sustainability in schools

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Building Use Studies and the Usable Buildings Trust
This is about ...

- Building performance in British schools.
- Mainly from the users’ point of view.
- With an emphasis on sustainable design features.
- With some strategic ideas, but also ...
- Some salutary warnings.

☑ More detailed information is available on application from Adrian Leaman and Rod Bunn and from the Publications pages of www.usablebuildings.co.uk.
Supply should follow demand ...

Sunderland School of Computing

Sun May 25 11:15:21 AM 2008

http://argus.sunderland.ac.uk/view/view.shtml

... supporting www.usablebuildings.co.uk
Based on...

... earlier Probe studies, Schools For The Future, and other material not in the public domain.
Performance before features ...

BE LEAN - Halve the demand
Review standards, reduce losses, avoid waste.

BE MEAN - Double the efficiency
Buy efficient equipment, use it efficiently, avoid system losses, tune it up.

BE GREEN - Halve the carbon in the supplies
With on-and off-site measures

You’re down to one-eighth of the CO₂
Don’t procure what you cannot manage
The ‘best’ case ...

<table>
<thead>
<tr>
<th>Aspect</th>
<th>Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>Temperature in summer: overall</td>
<td>Uncomfortable: 1 → 7: Comfortable</td>
</tr>
<tr>
<td>Temperature in winter: overall</td>
<td>Uncomfortable: 1 → 7: Comfortable</td>
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<tr>
<td>Air in summer: overall</td>
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<tr>
<td>Air in winter overall</td>
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<td>Lighting: overall</td>
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<tr>
<td>Noise: overall</td>
<td>Unsatisfactory: 1 → 7: Satisfactory</td>
</tr>
<tr>
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<tr>
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</tr>
<tr>
<td>Needs</td>
<td>Unsatisfactory: 1 → 7: Satisfactory</td>
</tr>
<tr>
<td>Health (perceived)</td>
<td>Less healthy: 1 → 7: More healthy</td>
</tr>
<tr>
<td>Image to visitors</td>
<td>Poor: 1 → 7: Good</td>
</tr>
<tr>
<td>Productivity (perceived)</td>
<td>Decreased: -20% → +20%: Increased</td>
</tr>
</tbody>
</table>

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The ‘least best’ case ...

<table>
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<tbody>
<tr>
<td>Temperature in summer: overall</td>
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Strategies # 1

- Client, users and the design team embrace the concept, understand design intent and provide sufficient resources to run the building efficiently and effectively.

Implication is ... Soft Landings.
Strategies # 2

- A simpler, less intensive approach with robust and basic systems which are easy for the users to understand and operate, and provide clear management and cost information about performance.

Implication is ... fit and forget simplicity with low intervention.
Location

Is it really necessary to site the building on the brow of the hill when there is so much land available?

... and this is?
Shape #1

Triangular form has unwanted and unforeseen side effects.
Shape #2

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Orientation #1

South-facing classrooms, often leads to glare and over-heating

... but daylighting strategy is often compromised too!
Orientation #2

North lit classrooms can be just as successful, if not better …

Note the density, and the lights are off!
Ventilation #1

Context needs to be thought through carefully to avoid conflicts, especially when window control is vital to good comfort conditions.
Space

Enough?

Time often just as important as space, if not more so.
Circulation

Often the key to good performance is the primary circulation.
Classrooms

Gluts and famines of use.
Often dismal acoustics.
Often excessively hot.
Noise

Phase 1: No doors on classrooms

Phase 2: Doors added
Storage

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Lighting #1

Well-balanced mixture of artificial and natural light working together without conflict.

Rare to find this achieved properly.
Lighting #2

But a single tail wagging the dog, in this case interactive white boards, can overnight make obsolete fifty years of thinking and effort on e.g. daylighting.
Reception

Reception areas are notoriously badly designed in all buildings, not just schools.

They also must be staffed ...
Ventilation #2

Ventilation and thermal control is universally a major problem area.
Make Performance Visible

Vital that information is clear and understandable, especially to bursars who pay the bills!

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Journey to School

Big potential for e.g. car sharing because of the predictable nature of the school day.
Laboratories

Fixed or movable?
Flexibility at what cost?
ICT rooms

Line of site / earshot vital for teacher. Often extremes of heat and glare.
Space left over

Rational space planning is often forgotten about in ‘green’ buildings.
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