

The University of Salford Research & Development Clever Classrooms in Sustainable Schools

About the project

Summary

The Holistic Evidence and Design (HEAD) project focused on the third (social) leg of sustainability and sought to identify the human impacts of the design of physical spaces on the health well-being and performance. Ground-breaking results have produced powerful evidence in the area of school design and impacts on pupils' learning rates, explaining 16% of the variation in progress overall, with detailed advice on optimizing specific aspects.

Project partners

The project involved a wide range of partners. At the core was a multidisciplinary research team with skills and knowledge from architecture, design, education, environmental science, soft data analysis, statistics and construction. In the initial ideas stage a link was made to a diverse international group of specialists in the all areas of sensory design, such as smell, light, air quality, together with neuroscientists linked to issues such as vision and way-finding. As the concepts crystallised out a strong link was made with IBI Group (architects) who funded the pilot stage and provided a highly practical voice to complement the academic team. The fieldwork called for work with a range of local authorities (Blackpool City Council; Ealing Borough Council and Hampshire Council) and the Heads, staff and pupils of thirty individual primary schools. The main project work was funded by EPSRC (EP/J015709/1).

The results

The problem

The impact of buildings on people's health, well-being and performance is, surprisingly, lacking in a clear evidence base. This is because various specific aspects have been studied, but looking at all factors together has proved too complicated. In addition it has proved hard to factor out influences other than the building design. The consequence has been a vacuum, despite huge amounts spent on buildings. This all holds true in the case of school sign and impacts on learning where the Education Endowment Foundation states there is "very low or no impact".

The approach

Working with a range of sensory design specialists and neurosciences a novel holistic framework was developed and speculatively published in 2010. This stresses three main categories: stimulation (appropriate level of), individualization and naturalness (the SIN factors). This addressed the first problem and multi-level



University of
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Profile

- HEI
- 20,000 students (includes full and part time students)
- 2500 staff
- Urban

Finalist's case study

modeling allowed the confounding factors to be separated out. In practical terms a large amount of data was needed: 3766 pupils, in 153 classrooms, in 27 schools, across 3 local authorities.

Our goals

To explore if there is any evidence for demonstrable impacts of school building design on the learning rates of children in primary schools.

Obstacles and solutions

Obstacles	Solutions
Situation with maximum influence of spaces	Focus on primary schools with pupils in one space for a year
Access to large number of schools	Collaboration with local authorities
Access to data on the academic progress of specific pupils in known classrooms	Collaboration with schools
Demanding analysis of complex data	Creation of balanced multi-disciplinary team
Need to be open to objective challenge and latest ideas	Creation of international sounding board

Performance and results

The headline result is that 16% of the variation in learning progress is explained by building design factors. This is a very major impact. The important individual factors that emerge as significant are a range of naturalness factors that amount to about half the impact; with the individualization and stimulation factors accounting for about a quarter each. This is the first time the scale of the impact and the elements in play have been isolated. Interestingly the level of stimulation has been revealed as curvilinear in its action (mid-level optimal). Quite unexpectedly, factors at the level of the school overall do not emerge as anywhere near as important as the design of specific classrooms. In fact almost all schools had a range of effective and ineffective classrooms.

The future

Lessons learned

The SIN model of factors to be considered, linked to multi-level modelling has shown significant utility in addressing this knotty type of problem. The initial paper was voted "best paper" by *Building and Environment* Journal and was its most downloaded paper. Thus this approach will be applied to other educational building types and to situations, such as dementia care facilities.

Sharing your project

Beyond the academic outputs that have made an impact, as mentioned above, a practical, illustrated "Clever Classrooms" report has been produced for teachers and designers. This has led to many contacts and events with these key stakeholders. At a policy level the Department for Education drew on the findings for their bid to the Spending Review, the OECD is taking the evidence into account in their work at an international level, the US Green Building Council is building on our results and the Norwegian Education Directorate has requested a workshop to work to articulate the findings with their imperatives.

What has it meant to your institution to be a Green Gown Award finalist?

The University of Salford is honoured to be a finalist in the Green Gown 2015 Awards. It is fantastic that a piece of research carried out by the university has received global recognition, but the Green Gown finalist nomination recognises the environmental aspect of the work. This will help highlight across the university the potential to further embed sustainability into the academia at the university.

Further information

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HEAD Final academic results <http://www.sciencedirect.com/science/article/pii/S0360132315000700>

Clever Classrooms Report: <http://www.salford.ac.uk/cleverclassrooms/1503-Salford-Uni-Report-DIGITAL.pdf>

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