Building Better Buildings: 50 years of Environmental Design and Engineering at The Bartlett

Building Performance Evaluation – Understanding the Performance Gap

Professor Mike Davies
1960
Richard Llewelyn-Davies joins The Bartlett

1967
Richard Llewelyn-Davies' planning practise works on the design of Milton Keynes

1975
Wates House opens

1978
John Musgrove is appointed as Haden-Pilkington Professor of EDE

1965
Ralph Hopkinson is appointed as first Chair in EDE

1969
Ralph Hopkinson receives RIBA Honorary Fellowship for establishing lighting as a core architectural skill

1978
MSc in EDE is launched

1987
MSc in Light and Lighting is launched
<table>
<thead>
<tr>
<th>Year</th>
<th>Event</th>
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<tbody>
<tr>
<td>1989</td>
<td>Pat O’Sullivan is appointed as Haden-Pilkington Professor of EDE and Head School and Dean of the Faculty of the Built Environment</td>
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<td>1992</td>
<td>The Bartlett School of Graduate Studies is founded</td>
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<td>1992</td>
<td>MSc in Facility and Environment Management is launched</td>
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<td>2001</td>
<td>May Cassar establishes the Centre for Sustainable Heritage</td>
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<td>2006</td>
<td>EPSRC Platform Grant (2006-11) awarded for the Complex Built Environment Systems project</td>
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<td>2009</td>
<td>Tadj Oreszczyn establishes the UCL Energy Institute</td>
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<td>2010</td>
<td>MSc EDE is awarded Happold Brilliant award for best accredited course by CIBSE</td>
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<td>2011</td>
<td>EPSRC Platform Grant (2011-16) awarded for The Unintended Consequences of Decarbonising the Built Environment project</td>
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<td>2014</td>
<td>The UCL Institute for Environmental Design and Engineering is established</td>
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UCL IEDE:

- Buildings and the urban environment
- Disciplinary excellence
- A cross-disciplinary approach

Our work cuts across the 4 UCL ‘Grand Challenges’:

- Sustainable Cities
- Global Health
- Human Wellbeing
- Intercultural Interaction
An example of a question: *Is it possible to both reduce the energy demand of our building stocks and achieve good IEQ?*
THE TOTAL PERFORMANCE OF
LOW CARBON BUILDINGS IN CHINA AND THE UK (‘TOP’)

- A new project funded by EPSRC and NSFC
- Tsinghua University (China)
- University College London (UK)
THE TOTAL PERFORMANCE OF LOW CARBON BUILDINGS IN CHINA AND THE UK (‘TOP’)

- ‘Building Physics’:
  - Monitoring
  - Modelling

- ‘Systems Thinking’
Stock Transformation

- 80% UK legally binding decarbonisation target by 2050
- 27% of UK energy consumed in dwellings
- 85% of existing dwellings will still be standing in the 2050s
- 1 home needs to be fully retrofitted every minute
UNINTENDED CONSEQUENCES

100 Unintended consequences of policies to improve the energy efficiency of the UK housing stock

C Shrubsole¹, A Macmillan¹,², M Davies¹ and N May¹
UNINTENDED CONSEQUENCES: MAPPING

Integrated decision-making about Housing, Energy and Wellbeing (HEW)

- Systems thinking
- Cognitive maps from interviews
- Collaborative mapping for stakeholders
- Causal maps, reinforcing and balancing loops
THEMES FROM THE INTERVIEWS

ENERGY EFFICIENCY AND CLIMATE CHANGE
THEMES FROM THE INTERVIEWS

- Ventilation and Indoor Air Pollution
- Household Crowding
- Energy Efficiency and Climate Change
- Community Connection and Quality of Neighbourhoods
- Housing Affordability
- Fuel Poverty and Indoor Temperature
- Land Ownership, Value and Development Patterns

Themes from the interviews include:

- Ventilation and Indoor Air Pollution
- Household Crowding
- Energy Efficiency and Climate Change
- Community Connection and Quality of Neighbourhoods
- Housing Affordability
- Fuel Poverty and Indoor Temperature
- Land Ownership, Value and Development Patterns
POLICY ASSESSMENT

Example: Green Deal take-up figures disappointing – why?
GREEN DEAL: UNDERSTANDING CONSUMER TAKE UP

- GD Impletations

- GD uptake vs time

- Desired vs Actual

- Households: Unaware of GD, Aware of GD, Potentially Interested in GD, Implemented GD, Lost Interest, Dissatisfied

- Trust, Experience, Attitudes, Values

- Green Deal: Understanding Consumer Take Up

- Industry Experience

- Trust Satisfaction effect on WoM via the causal map on ventilation, mould, and health

- Satisfaction on Capital Cost Barrier

- Time to gain trust

- Community Social Connection

- Satisfaction on Quality of Work and Cost Effectiveness

- TRUST

- EXPERIENCE

- OTHER SCHEMES

- FInANCES

- AWARENESS

- ATTITUDES

- VALUES
Research is needed to support:

- the development of relevant building assessment methods, technologies and tools
- the development of relevant policy and regulations in order to ensure the effective implementation of the above
UK CENTRE FOR MOISTURE IN BUILDINGS

Aims:
• The development of a moisture-safe built environment in the UK
• To substantially improve the way moisture risk is understood and managed in the UK

Means:
• An independent centre with national and international expertise, linking research, government, finance, industry and building owners/occupiers.
NEW COURSES

MSc Health, Wellbeing and Sustainable Buildings
NEW COURSES

MEng Engineering and Architectural Design
HERE EAST

CELEBRATING 50 YEARS OF ENVIRONMENTAL DESIGN AND ENGINEERING AT THE BARTLETT
Building Performance Evaluation - Understanding of the Performance Gap