Feedback to feed forward in Regenerative Design

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CIRS Conference 3rd November 2011
Personal journey....
Context....
architecture need to minimise the impact of climate change in terms of:

- cause  (design out pollution and waste)
- effect  (design in resilience and robustness)
- feedback  (involve people, processes and places)
Start from place....

critical realism....

bioregionality

3 campus evaluations:
  • Aberdeen
  • St. Andrews
  • Dundee

students as catalysts working with Estates Department

Local ‘live projects’ with communities
Paul Boldeneau’s foldable bike stand
The UK intentions....

‘Zero carbon housing’ (regulated emissions only...) = 70% reduction on CO2?

PassivHaus standard = 15kWh for heating, lighting, ventilation (120KWh overall)

‘Smart housing’

‘Integrated design’

happy occupants....

(anybody home.....?)
The UK reality.... in new homes

overheating in homes, especially in urban areas..... unwanted heat gains

poor cross-ventilation

malfunctioning, unintegrated new technology

unintelligible design (‘dumb housing’)

unusable products and buildings

unhappy occupants...
Key challenges....

situating CO₂ debate within ecosystems

maintaining place-based approach

globalisation of resource use

architectural education

including the user....
Building in time....

recycle v. re-use

design for deconstruction

design for adaptation and flexibility

design for climate change uncertainty

robustness in detailing.....

after Steward Brand’s ‘ How Buildings Learn’
Durable design increases usability

avoid perfection – make design **scratchable**

make design **cherishable**

increase the **meaning through memory**

avoid waste – **embody habit** over time

**design for discovery** not ‘cover up’
Luka Kreze’s recycled portacabins....mental health workshop near Oxford
Why do we need building performance evaluation?

‘Buildings use four times as much energy as predicted on average in UK’

Leaman and Bordass

We need to:

- understand the user response to buildings
- understand the *actual* building performance in relation to design intentions
Why feedback?

- improving design through evaluation
- feeding forward to improve briefing
- improving predictive modelling

**resilience through responsiveness.....**

Heelis HQ Building, FCB Architects

Sandy Halliday and Howard Liddell
Feeding back into the building cycle
Key problem areas...

tender documentation...roles and responsibilities

installation and commissioning procedures

handover procedures and guidance

.....especially in new ‘low carbon’ housing
Visualising feedback for buildings....

Not only a poor seal, but also the wrong door specification....
Working with health....

architecture and health

evidence-based design

linking user behaviour to building performance

includes aesthetics as a key cultural + physical determinant

‘Maggie’s welcomes the report’s positive and constructive findings...’

Laura Lee, CEO

A post occupancy evaluation of the Dundee Maggie Centre

Final Report for Sust.  
March 2007

Dr. Fionn Stevenson  
with Professor Mike Humphris

Ecological Design Group
School of Architecture
University of Dundee
In association with Bute Medical School,
University of St. Andrews and the Maggie’s Centres
BPE for materials....

architecture and manufacturing

involving bricklayers, plasterers, occupants, designer to test innovation

included embodied energy and whole building lifecycle

‘...the best project report I have seen’  
DTI Assessor

Low Cost Earth Brick Construction

2 Kirk Park, Dalguise: Monitoring & Evaluation

Tom Morton, Fiona Stevenson, Bruce Taylor, Nicholas Charlton Smith
people, process, place = design

household consumption = 75% of all CO₂ emissions

location is critical for mass customisation

human behaviours account for 300% variation in energy use

‘...aided our wider appreciation of sustainable development, consumer interfaces in a commercially focused industry manner.’

Stewart Dalgarno, Product Director
Agenda setting ....building performance

two year planning TSB BPE £8m Building Performance Evaluation programme

one year planning £6.5m AIMC4 project – 3 national housing developers

£100K KTP with Architype Architects for building BPE into practice

result – building performance evaluation is becoming routine in UK......