



Engineering & Environment: The Current Situation

Ageing and the Undergraduate Curriculum

EPSRC

Engineering and Physical Sciences
Research Council



Gerontechnology

- **Rehabilitation Engineering**
 - focus on the disabled person - some aspects are not at all unusual in engineering courses
- **Assistive Technology**
 - greater concern for those in the grey area between disabled and fully functioning – can be found in a wider range of courses (especially where electronics and computing are involved)
- **Inclusive Design**
 - broad concern for people of all abilities, social model – considers design and technology of environments, products and services to produce barrier-free environments
- However, AT and ID are not strongly represented, and are absent from most courses.

Two Perspectives

- **Medical Model**
 - Emphasis on disability and declining function
 - Physical disability
 - Vision and hearing impairment
 - Cognition and memory decline
 - Perspective of most Rehabilitation Engineering and some AT work
- **Social Model**
 - Age is not a disability
 - Environment and products can be disabling
 - Full participation in society is a right
 - Social connections and mobility are essential to good quality of life
 - Perspective of some AT and most ID work

Physical challenges



- Handicapped and disabled
 - is it the person who is handicapped or disabled
 - or the environment or product which is handicapping or disabling them?
- Dependent
 - why is the individual dependent?
 - Why can't they do the task for themselves?
 - Can't we compensate for physical, sensory, cognitive impairments?

Typical place

- Final year optional subject
 - mixture of
 - lectures
 - briefings from older or disabled people
 - covers sensory and cognitive as well as physical impairment
 - experiential element
 - project work
- Very unusually - introduced at an earlier stage

Main motivation to include these in undergraduate courses

- Personal interest of lecturers
 - often driven by
 - their research interests and
 - drawing on their up-to-date research materials
 - Reinforced by enthusiastic response of students
- Requirements of legislation
 - for example, some vocational courses require some coverage of disability (such as DDA, building regulations). Why not take it further?
- But such courses are unusual!!!
- Indeed, Council of Europe - **Resolution ResAP(2001)1 on the introduction of the principles of universal design into the curricula of all occupations working on the built environment** - is not an incentive

Available resources

- Depends on subject area
- For example, in construction, surveying, planning
 - Much available information on designing for disabled people and older people
 - A fair amount is linked to statutory requirements, regulations and standards
 - Some specialist texts in design area available for lecturers
 - Plenty of easy-to-do and attractive simulations (such as for different visual impairments, wheelchair exercises)
 - Quite easy to get outside speakers
 - Lends itself to project work and dissertations
- Recently some attractive materials becoming available
 - Cambridge Engineering Design Centre
 - Impairment simulators – physical, hearing, vision
 - Materials generated by specialist networks of designers interested in education and training (for example, European Disability Forum, Design for All Networks etc)
 - Yet because the contents are not prescribed by, say, legislation, there remains scope for developing very distinctive courses.

Three Very Different Examples

- EDeAN
 - (European Design for All e-Accessibility Network) – major activity in ICT area - speak to Gill Whitney
- Healthy Homes, Healthier Lives
 - Care & Repair for Department of Health's Care Services Improvement Partnership – information in your pack - appropriate to a wide range of courses
- Cambridge Engineering Design Centre –
 - Impairment simulator software, Inclusive Design toolkit, Physical impairment simulators, Exclusion calculator software

Main challenges for Engineering & Environment

- Getting wider take up rather than availability of materials
- Familiarising students with ageing/disability issues earlier in their courses
- Gaining acceptance by professional bodies that this is a mainstream issue not a nice add-on, so that it becomes a requirement

Universal Value

- Many of the materials
 - applicable across a wide range of courses
- Simulators
 - can be of value to
 - social scientists and artists exploring totally different environments as much as to designers trying to help people overcome the constraints caused by their impairments!
 - in medical and health for understanding how impairments and disabilities can be managed by changing the design of the environment, products etc

Ideal scenario

- Opportunity to bring courses together, to take a multidisciplinary approach to student projects
- Medical and health, physical sciences, social sciences, arts and humanities

That's all!