

Stimulating Gerontechnology research in the UK

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P.Lansley and V.Smith. Stimulating Gerontechnology research in the UK. Gerontechnology 3(2): 102-106. The last ten years have seen significant changes in national policies for research in the United Kingdom. Although relatively recent, the EQUAL Initiative of the Engineering and Physical Sciences Research Council (EPSRC) is providing an important and influential platform for university-based non-medical gerontechnology research.

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In the early 1990s the UK Government recognised the damage done to the international competitiveness of industry by 'market forces' research policies and this led to a review of national science policy¹. In 1993, in the landmark White Paper *Realising Our Potential*², a call for closer links between industry and research activity to address the competitiveness agenda was accompanied by a demand for more research concerned with improving the quality-of-life of the citizen. By 1997 there was a greater concern for health issues and the quality-of-life of the individual. Encouraged by a report about the implications of the changing age structure of the population³, a new initiative, to be pursued by the Research Councils, was announced by the Office of Science and Technology (OST). Termed EQUAL (Extend Quality Life), this was to focus particularly on the needs of older people^{4, 5}.

EQUAL

EQUAL was to be broad. It was to be concerned with a better understanding of the interactions between health, diet, and lifestyle; and the development of better technologies for healthy ageing. It was to address neighbourhood and individual security, improved leisure, and learning and financial services, as well as to help older people remain fit and active for as

long as possible. Underlying these objectives were serious concerns about the need to enhance independence and health, to compress morbidity and to reduce the burden on hospitals, residential care homes, and domiciliary care services. EPSRC responded with its own EQUAL Initiative⁶. This was to embrace the needs of all people with physical, sensory, cognitive and mental impairments as well as those of older people.

Initial advice to EPSRC, from influential individuals from across the fields of medicine, health care and social services, from charities, the voluntary sector, user communities, government and industry, emphasised two priorities. The first was aiding individuals to return as far as possible to their normal routines following discharge from hospital or from a period of incapacity or in the face of declining physical, sensory, or cognitive health. The second was helping older people in their daily lives so that their safety and health is not compromised, so reducing the need for health care as a result of accidents and avoidable illness.

Working with its advisors EPSRC developed a framework for supporting research which reflected a belief that effective gerontechnology research, would have to meet three key criteria. Firstly, all

projects would be interdisciplinary and whilst high quality design, engineering and technology research had to underpin the rationale of a project, this would not be to the detriment of other disciplines. Thus, research teams would be genuinely interdisciplinary, for example, with architects and engineers working with medical and health professionals. Secondly, project teams should collaborate with organisations concerned with providing services and products to older people or representing their interests. Thirdly, all projects would have a strong user focus, and involve older or disabled people in the research process. Emphasising interdisciplinary, collaborative working and a strong user focus in this way was a significant departure from the established practice of EPSRC. Thus, an initial challenge was to build a new research community capable of undertaking substantial high quality projects which could meet the exacting standards, not just of academic peer review systems, but which survived the scrutiny of practitioners and the common sense evaluations of end users - older people.

THE PROGRAMME OF RESEARCH

In late 1997 there was a modest first call for proposals focused solely on the relationship of the older and disabled person with the Built Environment⁶. A second call in late 1998 was to introduce industrial and product design by adding the theme of Design for All⁷ and a third call in 2000 was aimed at a broader range of science and engineering through the theme of Rehabilitation⁸. Finally, in 2001 there was a further call for very large projects, again focused on independence and quality of life.

As a result of the first three calls, 34 projects with a total bid value of £5.4m were funded⁹. Project values ranged from £33,000 for a one-year feasibility study of

life-time homes to £400,000 for a three year investigation into inclusive design. The fourth call was for the development of research consortia, five of which were funded with each receiving over £500,000.

The projects range from studies of the interaction of the individual with their environment to those involving the appraisal and development of new technologies. All require a combination of the perspective of the user as well as ingredients from the social and medical sciences combined with those from design, engineering and technology. Further, whilst all projects are concerned with some aspect of technology at least as many medical and social scientists are involved as physical scientists, engineers and technologists.

THE PROJECTS

The projects, details of which can be found at the EQUAL Website⁵ are summarised in Table 1.

Understandably the home is a central feature of the Initiative, supporting investigations into ways in which older people can remain in their own homes rather than entering into formal care settings, and how the services they receive can be enhanced. Fundamental research has been carried out into changing patterns in the use of the home with age and the much lauded *life-time homes standards*. However these standards apply to new homes and most people live in existing homes, many of which will need to be adapted. An example is a project on the development of affordable modular units (especially kitchens and bathrooms) which can be hoisted by crane into the back garden of, for example, Victorian terrace houses and connected to the main structure. As might be expected, there have been several projects looking at the potential impact of modern information

Table 1. Summary of EQUAL Project themes and Outputs

Theme	Projects	Outputs
The Existing Home	Profiling use of the home from domesticity to caring; Realisation of lifetime homes standards; Modular adaptations - kitchens and bathrooms; Smart homes; Advanced sensors; Communication systems for distributed sheltered housing; Telecare.	Policy inputs on housing design, telemedicine and long term care for housing providers, local and central government; Design and production advice on modular building extensions for industry; Prototype smart home devices and business cases for telecare for service providers.
Improving Accessibility	Using GIS for urban navigation; Using smart cards for urban navigation and within buildings; User perspectives on navigation and mobility in complex spaces; Accessible rural public transport.	Prototype urban navigation systems for disabled people - some suitable for commercial development; Viable operational rural transport systems.
Design for All - Buildings and Environment	Designing buildings using VR motion platform for wheelchair users; Best practice and better briefing for building designers; Getting out of doors.	Novel 'roll through' VR systems for wheelchair testing of building designs; accessibility design guidance for clients, architects and urban planners.
Design for All - General and Other	Improved design methods; Better design data sets; Integration of biomechanical and psychological parameters of performance in CAD systems; Hand object interaction and packaging; Hospital portal for use by patients.	Inclusive design data sets, design methodologies, technologies and advice for designers; Inputs to British Standards on management of inclusive design; Specific data and advice for packaging manufacturers and the retail sector; Prototype inclusively designed accessible hospital portal; Business cases for inclusive design and for meeting the markets created by the needs of older people.
Sensory Impairment - Hearing and Sight Loss	Hearing: Hearing loss in the built environment; Design, colour and communication in the built environment; Acoustic guidelines for class room design; Self administered hearing test. Vision: Glare disability and glaucoma; Auditory navigation for emergency egress; Auditory location finder in urban spaces; Better document production by blind people.	Design data and advice for building clients and architects; Input to building regulations and British Standards; Prototype navigation and emergency egress systems; Audio cassette system for home based test for deafness; Wizards to aid blind people in the production of computer documents.
Cognitive Impairment - Dementia, Stroke, Learning Difficulties	Dementia: Design of care homes for dementia patients; Design of the external environment for people with dementia; Smart homes and mild dementia; Supporting reminiscence in dementia patients. Other: Cognitive-motor skills following stroke; Smart rehabilitation in the home; Input devices for people with learning difficulties.	Advice on design and management of dementia care homes for health care providers, central and local government; Development and integration of assistive technologies for housing providers; Novel IT systems for eliciting reminiscence and supporting carers; Prototype exercise devices for stroke patients and those with learning difficulties for use by physiotherapists, other health workers, carers and individuals.

and communications technology on the life styles of older people. These projects have stimulated the interest of housing authorities, health and social services organisations, private sector care providers and industry, all of which will play important roles in the development and eventual widespread application of the technologies.

Many people can continue to live in their own homes through adaptations to their properties and the provision of fixed and personal assistive technologies. But being able to go out of doors, is another important aspect of independence. Sometimes even the configuration of the entrance to a public building can be a barrier, so too can be the design of the neighbouring streets, urban spaces and public transport systems. Thus, some of the projects have been concerned with developing design and best practice guidance on accessibility for building clients, urban planners and architects.

The usability of products by older and disabled people is critical to their ability to live independently. Domestic appliances and consumer products can provide particular challenges for those who, for example, are frail, infirm or have reduced vision. However, those who wish to design for older people have difficulty accessing relevant design data, for example, anthropomorphic measurements of older people, on which to base their designs.

Not all projects are concerned with the design of the environment, products and services which are more inclusive of older and disabled people across a wide range of health conditions. Some focus on particular health conditions and disabilities. Several are developing a fundamental understanding of the experience of the built environment of older people with hearing loss and sight loss, for example, the impact of the design

of the built environment on the ability of people to communicate, and a study of the consequences of glare for patients with glaucoma. Other projects link with accessibility and navigation, for example, the development of an auditory location finder for use in urban spaces to identify, for instance, bus stops, significant buildings and their entrances, and the development of a navigation beacon for use inside of buildings to assist with emergency egress. In contrast one project is developing a self-administered hearing test for older people who cannot or will not attend a hearing clinic.

Projects concerned with dementia, memory loss, and rehabilitation following stroke which exploit novel information technologies have created considerable interest amongst medical and health practitioners as well as families and carers of people with dementia. They are offering new possibilities for improving the quality of life of both the patients and those who care for them.

Outcomes

Even though the Initiative has been in existence for a relatively short period findings from projects are already being used and are influencing the lives of older people and disabled people. Because of the nature of the projects, usually involving organisations which directly serve older and disabled people, there are immediate benefits for these collaborators. However the projects are also influencing the development of national policy, providing inputs to standards and regulations, assisting the professions and supporting those who commission and design homes, public buildings and urban spaces as well as products and services. Influencing the development of the built environment, services and consumer products which are more inclusive of the needs of older people is a long term process. However, once research findings

have made their way into regulations, standards and design guides they will have a systemic effect on the quality of life of older people.

CONCLUSIONS

The EQUAL Initiative has demonstrated the ability of a conventional research funding agency to provide a strong platform for the development of a radically new research culture. In pursuing its agenda for ageing research EPSRC has recognised the importance of the different stakeholders and has facilitated a strong link between these stakeholders and both the research community and research policy makers. This has led to modifications and refinements of research policy which have been wholly conducive to the adoption of the resulting research outcomes.

Much of the research output has implications for the care of older and disabled people in the community and can directly inform national and local initiatives. This will contribute in the longer term to the development of environments, products and services which are more supportive of older people. The issues for, say, clinicians and health service managers is how far the findings from projects point a way towards reducing the admission of older people to hospital and enable them to return home earlier, to complete their convalescence, or where this is not possible, to move to some intermediate care setting. Other issues relate to whether the home and other settings can be designed or modified so that individuals can enjoy a good quality of life and reduced dependence on formal care services. A number of the projects, especially those relating to the home, sensory and cognitive issues and rehabilitation, provide a strong and positive indication of what might be possible. Recently commenced consortia projects will take the outcomes from the

initial projects to a higher level, working with health care providers and a myriad of other organisations, with every prospect of a beneficial impact on independence and quality of life of older and disabled people.

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