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## Recent Advances in Assistive Technology and Engineering (RAATE) – a UK perspective

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We are delighted to be given the opportunity to showcase a selection of papers from the annual UK assistive technology conference “Recent Advances in Assistive Technology and Engineering” (RAATE).

This year the RAATE programme covered technology as diverse as brain computer interfaces, to postural seating in nursing homes; and subjects as broad as a European code of practice for telehealth services to a case study on multidisciplinary team work in spinal cord rehabilitation.

### The role of the user in Assistive Technology (AT) research and service provision

The papers presented here give a flavour of this range. Many themes can be found running through this small selection however the predominant theme is the user. These papers highlight the importance of user involvement in the design and specification of AT; of evidencing the impact of service provision on users; of basing this provision on sound evidence and of understanding the reasons why users may decide not to take up use of these technologies.

The design and commissioning of services to deliver AT has been an ever present theme throughout the years. Therefore we need to be able to measure and benchmark the levels of service provision and to understand the impact of service provision on users. The challenge is in finding outcomes which are meaningful to the user; reliable and repeatable; sensitive to changes that, anecdotally, we know to be important and practical to perform in the busy and pressured service delivery environment. As Enderby discusses in her paper:

*“If we are to reduce variability and inequity in service provision as well as striving for year-on-year improvement it is important that we identify the impact that we are having and the differences between services in the influence they are having on the recipients of their intervention”.*

Enderby provides a review of outcomes measures used in one area of assistive technology (augmentative and alternative communication - AAC) and discusses the conceptual frameworks in which these measures sit. Enderby then proposes an adaptation to an existing outcome to overcome some of the challenges of the measures currently used.

Understanding and working with the available evidence in what can be considered a relatively ‘evidence poor’ field is one of the other areas that is frequently presented and discussed within RAATE and UK services. Murray et al. provide an excellent introduction to the issues around the use of evidence within AT. The authors then look at how collaborative working and a single case study methodology might be used to build a library of evidence to support the development of practice. The adoption of the case study template developed through this work would have a significant impact on the level of evidence available by allowing the aggregation of this case study data. The work presented is related to AAC however the discussion, principles and approach could be transferrable to other areas of AT. This paper is dedicated to the second author, Alan Martin. The

work of Alan provided a shining example of user involvement in research and his death is a great loss to the field.

There are many potential methods to involve users in the design of devices and services and three of these are presented in the next papers. There are complex and challenging relationships between design, user centred and inclusive design, engineering, rehabilitation engineering, mainstream technology and assistive technology. The paper by O'Rourke et al provides a significant contribution to this discussion. The authors report on a novel use of the use of the Delphi method to improve the design of special access technology. This study provides a method for exploring key issues associated with the design of devices. It also demonstrates the complexity of AT design and provision in that this technology has effectively 2 sets of "users": the professional advisor/provider as well as the end user. Here the study engages the professional group to discuss issues of design. The study demonstrates the potential of this method to facilitate the design of assistive technologies whilst also providing evidence for the need for user input in the development of devices. The study also highlights the evolving relationship between mainstream technology and inclusive design and their relationship to customisable assistive technology products.

Verdonck et al uses a qualitative analysis method to investigate the impact of provision of environmental control systems on users. The paper describes the stages from introduction to acceptance and the different course this takes for individuals. The study takes place in a population where there appears to be a low level of provision of this technology and so the authors were able to run an interventional study where the technology was introduced in a relatively controlled way. This can be challenging, for ethical reasons, in other populations. The *'interplay of hassle and engagement'* is presented by the authors as one of the main findings and they conclude that,

*"If ECS are introduced after adaptive habits have been established, the hassle involved in undoing these habits in order to become used to using ECS may be particularly challenging".*

Carmichael et al also discuss a participatory research method in projects developing new technologies, in this instance the development of brain computer interfaces (BCI). In this paper the authors consider the ethical considerations of this user involvement. The user group considered in this study may be considered particularly vulnerable and BCI technology may also be considered to offer the most scope for false hope and overly *"heroic narratives of transformation and independence"*. Balancing these considerations with the need to develop systems to meet the needs of this group of people presents a number of ethical challenges and these are presented by the authors in the context of this BCI development study.

The final paper in the issue is by Sugarhood et al and describes a study looking at adoption of telecare technology by people who may benefit from this kind of support. The authors analysed data from interviews with professionals against a framework of innovation adoption. It concludes what is found in many areas of AT that the successful implementation is not merely about the technology itself (i.e. knowledge of product base and specific choice of what to use), but rather this is a complex innovation requiring input and co-ordination between people and organisations and that in order to be successful these contextual factors need to be understood and addressed.

### **The RAATE Conference**

RAATE is the only UK conference focused on the latest innovations and developments in assistive technology (AT). This conference is aimed at anyone who uses, works with, develops or conducts research into AT. It is unique in that it targets a multidisciplinary audience including therapists, engineers, teachers, researchers and suppliers. Alongside a schedule of parallel sessions of papers,

workshops, case studies and posters an important part of the meeting is the opportunity to meet with the manufacturers, suppliers and developers of AT in an exhibition. We also invite international keynote speakers to address our meetings each year.

RAATE recognises that successful usage and uptake of AT by its target population is not just about the equipment itself therefore we invite papers on AT in its broadest sense. As well as the technology, subjects as diverse as outcome measures, service development, individual case studies and effect of policy change are also presented.

The aim is to bring AT professionals together to have a better understanding of their subject area. They have the opportunity to learn about a wide range of AT and so understand better the interface issues and the broader picture of AT in the lives of their clients.

RAATE ([www.raate.org.uk](http://www.raate.org.uk)) is organised by a group of professionals all working in the area of AT. We work with the charity FAST (Foundation for Assistive Technology - [www.fastuk.org](http://www.fastuk.org)) an organisation which promotes the development of the field of assistive technology and produces the annual UK Government Parliamentary report on AT research. The event is hosted and co-ordinated by the Health Design and Technology Institute (HDTI - [www.coventry.ac.uk/hdti/](http://www.coventry.ac.uk/hdti/)) a centre which supports the development of new and innovative healthcare products and is part of Coventry University.

Each year between 50 to 70 papers are submitted from the UK and beyond for this one day meeting, demonstrating the ongoing and growing interest and investment in this field.

We hope you find this selection interesting. All the abstracts and many presentations from this year and previous years are available on the RAATE website. We look forward to welcoming you in November to RAATE 2013.

On behalf of the RAATE organising committee

- Donna Cowan- Consultant Clinical Scientist, Chailey Heritage Clinical Services
- Simon Judge – Senior Clinical Scientist, Barnsley Hospital Assistive Technology Team
- Colin Clayton – Independent Clinical Scientist
- Aidan Parr – Research Assistant, Foundation for Assistive Technology
- Simon Fielden – Director, Health Design and Technology Institute
- Paul Dryer – Joint Head of Rehabilitation Engineering , Kings College Hospital