

Juliet Sprake

Curriculum Manager
for Technology,
Islington Arts and
Media School

Abstract

A recent report from the Department of Trade and Industry (DTI) highlights the role of design (of everyday consumer products) for people with physical impairments.

'It is a human rights issue: if you have millions of people who can't do these things then they are being deprived of quite a few choices... excluded from using household products because their needs are not being fully considered at the design stage.' (Kim Howells, Consumer Affairs Minister, *The Guardian*, 25 August 2000)

It is important that students understand the multiplicity and the variety that exists under the label 'user'. Examining users with impairments can help to identify for students the need for individuality, and this paper describes how values-led design can offer students opportunities to design innovative and challenging products that avoid stereotypical interpretations.

Whilst everyday consumer products are usually well designed for safe use by able-bodied people, some are not necessarily designed to suit all the special needs of disabled people. This means that some consumer products cannot be used by disabled people, and others cannot be used as efficiently, which both inhibits business in meeting market expectations and consumers having the widest possible choice. (DTI, 2000: 1)

The data produced in this DTI report is aimed at designers. Although underlining an inclusive design philosophy, the report is perhaps more important in its emphasis on the 'people factor'. Participants with disabilities of varying levels of severity were set tasks in using a wide range of everyday consumer products (from opening jam jars to folding ironing boards). They were assessed according to a scale based on the Assessment of Motor and Process Skills (AMPS) system:

'AMPS is a test of disability and an occupational therapy measure of a person's ability to live independently. It is not a test of impairments or capacity to do a task, but a test of disability and how effectively a task can be done.' (DTI, 2000: 3)

The focus of the tasks was on the use of everyday products in the home by people who are disabled to varying degrees. The report indicates that the purpose of the findings is to give designers the data they need to design better consumer products for everyone – including those with physical impairments. It suggests that the everyday products that were

tested were a compromise, making concessions to the 'universal' user. Finding myself in an electrical appliance superstore recently (to buy a new kettle), my final choice was made on the shape of the handle and the overall product style. But there was actually very little to choose between the 20 kettles. Compromise in this instance reflected a lack of real choice for widely differing human needs.

Optimisation or differentiation?

Good design is a visual statement that maximises the life goals of the people in a given culture (or, more realistically, the goals of a certain subset of people in the culture) that draws on a shared symbolic expression for the ordering of such goals. If the system of symbols is relatively universal, then the design will also be judged good across time and cultures. (Csikszentmihalyi, 1995: 125)

If maximising 'life goals' is what good design is about then surely being able to use a range of everyday household products safely is a universal goal for everyone. Whilst the goal is the same, its achievement requires a different way of thinking when designing for the lives of people with physical impairments. Universal goals are very different from universal users.

The 'system of symbols' by which a user actively engages with a household object characterises the cognitive response to the product and determines how it is used. For example, a knife could be bought as a cutting implement but could just as well be used to lever a lid off, threaten someone with violence or scratch a mark depending on the meaning that the user constructs with the object. It is the way that the user makes sense of the product that determines its use in different contexts or situations. A designer's job then is to understand as much as possible about the sense a person makes of a product in order to predict what they might need next.

'Form and meaning are intricately related, [however,] and their relationship is a fundamental concern of product semantics. Something must have form to be seen but must make sense to be understood and used. (Krippendorff, 1995: 161)

The theory of product semantics focuses on (designer's) form and (user's) meaning. If we see this as an inseparable relationship then we can start to understand both the emotional and practical sense we make of a product. In the context of everyday consumer products for disabled consumers, if the form of an object is inextricably bound within its function then it is possible to design household products that both appeal to and can be used by a wider

market. This isn't compromise; it's getting the balance right.

Perhaps it is an over-emphasis on aesthetic appeal (in line with a 'Changing Rooms' philosophy) that has created a wide range of kettles that all boil water but vary little in their suitability for a range of users. One consequence of this homogeneity is (of course) that individualised users are all ill served by the products. Some are (of course) more ill served than others and disabled users have particular difficulties. The DTI report suggests that this problem will only be overcome if designers 'live the lives' of those with physical impairments.

'Although there is good ergonomics data on handle design for products such as kettles and teapots for use by the disabled population, the *applicability* of this data to the disabled population has not been verified.' (DTI, 2000: 64) [my italics]

The designer has not only to make sense of a physically impaired user in their immediate context of making a cup of tea, but also has to understand this in relation to other breakfast activities in addition to the extended use of the kitchen and the home. In other words, a holistic understanding of the user's relationship with the product, or family of products, concerned.

'Design through observation of people, what they do and where they do it. It is by careful study of the world around us, and how individuals interact with it, that we gain an understanding of what people really need and inspiration for what they might want.' (Moggridge and Brown, 1999: 92)

Both motor and process factors were identified as part of the research criteria and it is interesting to note that these elements focus entirely on the user rather than the product itself:

Motor factors

- Manipulates.
- Lifts.
- Grips.
- Transports.
- Reaches.

Process factors

- Gathers.
- Organises.
- Uses.
- Notices/Responds.
- Terminates (understanding the task is complete). (DTI, 2000: 11)

How then can values like these be central to product development in design and technology in secondary schools?

Values-led design

- First, establish a design philosophy.
- The best design comes from thinking like a person, not a job description.
- The best design comes from finding the things that bring us grief, that make our lives worse, not better, and fixing them.
- Replacing drudgery with fun.
- Replacing mind-numbing complexity with elegant simplicity, whenever you can.
- Replacing ugliness with beauty.
- Making things better. For people. (Seymour, 1999: 21)

Focusing on the user and how they imbue a product with meaning (i.e. what it means to them in the context of their life, in different situations, how it relates to other products, what it is used for other than the intended) creates opportunities for *different kinds of design problem*.

Many people think of product design as the creation of the form and shape of everyday objects, an idea that is reinforced by the display of products on pedestals in museums. We think that this is a misleading notion. Products, services and environments must always be designed in a broad context that considers the whole experience of use and interaction. Rather than thinking just about visual aesthetics, we need to be creative in the design of expressions and behaviours ... opportunities to create an aesthetic experience come into their own when you design for the whole experience. (Moggridge and Brown, 1999: 90)

The human interface is where a product has meaning – not on the shop shelf or on the designer's desk. Krippendorf also argues that:

'designers who are aware of product semantics may work quite differently from those who are not. They articulate different aims and criteria and tackle different design problems.' (Krippendorf, 1995: 157)

My experience of design and technology in secondary schools has focused on the design and manufacture of products. Projects have typically been driven by the product outcome, often with the aim of covering the appropriate skills and knowledge for that project. This is not to say that the user didn't feature, but merely to suggest that once they had been identified (for the purpose of the project

brief), it didn't much matter how they related to that product within the context of their everyday life. They became the generalised – the 'universal user' – even within an identified group or subgroup.

For example, a GCSE project based on designing outdoor activity equipment for children with disabilities focused on the types of disability and specifications for accessible play. We did not look at the reality of how individuals played, nor indeed did we observe children (with or without physical impairments) playing, using the observation as a source of inspiration for how they might want to play in the future. Either might have created opportunities for innovative approaches.

Information on specifications for accessible play equipment (HAPA, 1995) dominated the early stages of design development. Whilst acknowledging the important part this research had to play in the project, it seriously constrained the students' thinking. The needs of the user were defined – by extension – from the physical properties of the product. This resulted in safe, sound and uncontroversial outcomes, and there wasn't much to talk about. The final outcomes included models of integrated climbing/sliding equipment, a wendy house, sensory walls – designs developed from existing examples of play equipment for disabled children. Students modified what was already there for children with special needs rather than focusing on what stimulates play and how this could be further developed through a different kind of product. It wasn't innovative design. New or innovative ideas were hard to come by given this approach.

Bill Moggridge and Tim Brown of the international design company IDEO, describe a 'new challenge for design':

'At IDEO we have steadily moved away from a sequential idea of design process towards a set of values which contribute to a rich design and innovation culture. These values provide a framework within which chaos, risk, experimentation, innovation and vision can thrive...' (Moggridge and Brown, 1999: 91)

They go on to describe these values that define a different kind of design process. They are summarised below:

- 'Treat life as an experiment by constantly exploring new ideas through projects.
- It is important to be smart about creating and sustaining groups of energetic, opinionated people from diverse backgrounds.

- Don't leave the user focus to the early research stages of a project.
- Hypothetical characters, based on knowledge and understanding gained from user research, can be used to populate storyboards and scenarios that become the environment for exploring and communicating ideas of interaction, experience and behaviour.
- It is far more useful to learn today with a prototype that is only 80% right than wait until next week for that last 20%.
- Remember that the best learning and some of the most inspired ideas happen away from your desk.
- Teams need to create spaces where they can work together and display historical content of the project.' (Moggridge and Brown, 1999: 91)

Ricky Wilkinson, Technology Co-ordinator at St James C.E. Middle School, describes a project that involves teams of students working with their clients (children with special needs) through this kind of collaborative and problem-solving design process. Year 8 students make two visits to a special school to work out what to design and make and to test and modify their products.

'Collaboration with the 'experts' – in this case the therapist or teacher of the disabled child, enables a clearer focus of design requirements to take place.' (Wilkinson, 1999: 201)

The universal goal for these designers is to create learning opportunities for children in school and it is a detailed understanding of the needs of their individual clients with highly individualised needs that results in good quality, challenging and innovative outcomes.

'Some extremely ingenious, high quality solutions to challenging design problems have been produced – higher in quality and technical difficulty than ordinary design tasks like an acrylic Walkman stand or a moisture detector seen elsewhere with Key Stage 3 pupils.' (Wilkinson, 1999: 203)

Students were put in a situation where they could affect real change through a developing relationship with their user in situ. A teacher's response during an evaluation session sums up the importance of this interaction:

'The pupils brought their ideas, made adaptations, explored their prototypes with us and were careful to look at all aspects of safety as well as why they had made the toy.' (Wilkinson, 1999: 204)

This not only sustained enthusiasm and motivation for developing a wide range of outcomes but ensured those toys were successful. In this project, there was a lot to talk about! Users were definitely not universal; their needs were specifically identified through a design process that had a clearly identified goal requiring knowledge about the user within a learning/playing environment.

Client centred assessment?

'...simply doing something differently is not enough to create value on its own: to be useful creativity must meet a purpose, and to do this its *value* must be judged or assessed.' (Seltzer and Bentley, 1999: 30) [my italics]

Assessing value in students' coursework in design and technology exams was expressed as a fairly unanimous concern in response to one of the key note lectures on creativity at the International Millennium conference this year. A delegate voiced the need for exam boards to rethink the way in which design is assessed through presentation portfolios. We are familiar with the artificiality problem of the portfolio assessment. The reality of design processes will be characterised by messy bits of thinking, riddled with necessary mistakes, lots of verbal stuff, reflection, evaluation, doodles, plasticine lumps, fantastical sketches – design activity that cannot be represented through neat A3 pages in a beautifully bound portfolio. It is widely recognised that current portfolio models have become a burden for students who feel the need to repeat in a neat way what they've moved on from ages ago. I know this because I often told students to do the portfolio after they'd finished making to suit the sequential nature of exam board criteria. And we all recognise that design thinking just doesn't work in this way.

Moreover the requirements of the portfolio have other unfortunate side effects.

'Within the creative activity of designing and making there are many opportunities for cultural activities, but these are only infrequently grasped, particularly with older students, due to pressures of generating assessment evidence.' (NACCCE, 1999: 13)

If a design process is value led, students need to have assessment criteria that recognise the role and importance of individualised values. One alternative to the current approach to assessment might be in the form of a client presentation. The focus would be on telling the story of the design, presenting its history to an audience of clients and users through a multi-dimensional presentation. Students could be assessed on their knowledge about

the end-user as well as their ability to communicate design development. This, I would argue, provides the basis for developing fluency and creativity in the use of design language.

Of course, this is not new.

'...concrete expression (by whatever means) is therefore not merely something that allows us to see the designers ideas, it is something without which the designer is unable to be clear what the ideas are.' (Kimbell *et al*, 1991)

The now familiar 'interaction between hand and mind' model developed by the APU reflects the fluid, flexible nature of design thinking – and emphasises the centrality of user interaction in developing the design. I would argue that consideration of how people live their lives (now or in the future) should lead such design activity in schools.

One project brief that put people (and how they live their lives) at the centre of this philosophy was for the new library in Peckham, South East London:

Peckham Library and Media Centre – brief for an architectural design

'It should be a thoroughly modern building that is ahead of its time but also one that does not alienate local people by giving an appearance of elitism, strangeness or exclusivity. Local people must be able to relate to the architecture and design as well as the services provided and they should feel pride in, affection for and ownership of the building. This is an essential criteria if the building is to succeed as a social and cultural anchor-point for the community.' (Southwark Council, 1996: 9)

Design that!

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