

THE VALUE OF DESIGN RESEARCH

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CAUTION CO-DESIGN - IF IT'S NOT ONE THING IT'S ANOTHER

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ABSTRACT

Our patterns of learning are changing dramatically as digital literacy skills become essential to survive and thrive independently in the 21st century. The UK government initiative, Digital by Default, intends to digitize all services for digital access by 2014 (ScotGov 2012) Concerns are high given our financially challenged public services that this goal can be met. Considerations to teaching and learning around access of digital services should be a priority, especially for those excluded to digital development by impairment or disability. This paper reflects on the interdisciplinary pilot, It's-not-one-thing (in1t), utilizing a multimodal approach to support an excluded group with a communication impairment called aphasia. While communication in the industrial age was primarily written, the recognised mode of the post industrial age is multimodal and includes writing, speaking, visual forms, gesture and gaze (Kress 2014). (Sanders & Stappers 2014) Co-design approaches to designing for, and with, people with aphasia (PWA) to learn about digital literacy, is an innovative form of rehabilitation, maximizing the new modes of human communication. This paper looks at the co-design process and prototypes designed with PWA explored in a customised learning environment. E-Learning R&D, defines the role of personal narratives as crucial to adopting new behaviours towards digital technology (Roberts 2013). We see this project/scenario as an immaterial level of e-pedagogy/service and begin the conversations to share and evolve new knowledge (Dubberly&Pangaro 2009) through this paper as personal narratives in Post Industrial Design.

Keywords: Co-Design, Prototyping, Roles & Goals, Technology, Relationships, Service Opportunities

1 INTRODUCTION

Current social ways of thinking are reshaping how we view previously defined and understood concepts of education and health. A social constructivist model is now considered a natural pedagogical paradigm for learners to be *active, creative, and socially interact online* (Felix, 2005). The web has enabled a way of acquiring knowledge that means teachers are no longer the conduits to transfer knowledge to learners. Teachers now facilitate learner participation with other learners, and support learners to acquire knowledge by tapping into multiple resources (ibid).

A challenge lies in providing meaningful and effective social interaction when disability and communication impairment present in learners. Learning is changing by the nature of the digital tools that we use. Thompson (2013) states that every new tool shapes the way we think, as well as what we think about. Today we have opportunities to interact and communicate through an increased

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number of interfaces. Kress (2014) stipulates, that with this we need multiple models of engagement with the learner at the center of the process. The pedagogical shift has seen teachers and health professionals become facilitators and coaches. At one time health care professionals informed us if we were well or ill. The change in role sees health care professionals share a patient/learners journey. Dubberly, Mehta, Evenson & Pangaro (2010) define this as 'healthcare as a designed service' where the power structures are changing, and a patient centred led approach, is emerging for individual care directives.

In the case of in1t, aligning the multiple goals of education, design, health and human computing meant a Participatory Design approach with Co-design methods would be best practice. The role of design ethnography was considered key to understanding the workbook and workshop prototypes in the research evaluation phase. Evidence and analysis of design-in-use and defining the motivations and priorities (*Balka*) of the multidisciplinary team through co-realisation and critical reflection (Bloomberg & Karasti) post design is a focus of this paper.

Participatory Design has its roots in Western society's social, political and civil rights movements of the 1960's and 1970's (Robertson & Simonsen 2013). The principals in PD are: *equalising power relations; situated based actions; mutual learning; tools and techniques; alternative visions about technology and democratic practice (Greenbaum et al).*

PD is described as a 'hybrid of many sorts, where both the process and product of the PD activity, are shaped to meet the needs of participant defined goals and design-orientated activity' (ibid). It is no surprise therefore that PD is found to be *complex, messy and slower moving (Greenbaum& Loi 2012)*. However slow moving, the field of (PD) has grown rapidly over the past 20-30 years (Sanders, Brant & Binder 2010), highlighting its suitability for addressing our increasingly complex problems. Sanders & Stappers (2008) have defined Design contexts in PD history, through clear definitions and terminology.

Co-creation: is the collective creativity of hybrid activity; and Co-design: is a part of the co-creation process, where designers work with those not trained in design, during the design development process. A four phase process they define as: pre-design - generative - evaluative - post-design.

The in1t workbook and workshop revolved around the Sanders and Stappers (2014) framework for making prototypes in Co-Design and the Stanford D-School design methods for evaluation (2011). Sanders and Stappers show that Co-design involves various creative acts of making as tangible ways to test concepts. The makings of prototypes are physical manifestations of ideas, which give tangibility and generate feedback from stakeholders. The use of iterative prototyping provides Co-design participants with ways to engage and understand the making practices of participation and also provide views on future experiences and future ways of living (ibid).

We used a selection of methods from the Stanford D School's toolkit to evaluate the workshop and workbook prototypes. The D-School's democratic dissemination of methods through the creative commons enables multidisciplinary democratic practice. This mutual learning is adopted across disciplines described by MacDonald (2012), Bloomberg & Karasti (2013) Sanders, Brant & Binder (2010). The hybrid mix of traditional scientific methods and designerly ways of working is now used within the communities who

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practice Human Computer Interaction, Design Ethnography, Critical, Co-operative, Universal, User Centred, Service and Transformation Design.

The role of design ethnography was considered key to understanding the workbook and workshop prototypes in the research evaluation phase. Evidence and analysis of design-in-use and defining the motivations and priorities (*Balka*) of the multidisciplinary team through co-realisation and critical reflection (Bloomberg & Karasti) post design is a focus of this paper.

The title of this paper came from a safety floor sign, seen at a design student's degree show in May 2014. The yellow plastic Caution sign used to cover a slip hazard, had been adapted to read Caution Co-design. The authors returning from a planning meeting with the it's-not-one-thing (in1t) team realised they too were in slippery territory. The team established in December 2013, consisted of two speech and language therapists (SLT's); a design educator; a service designer and a rehabilitation engineer. They had come together to work with PWA to increase confidence, well-being and accessibility to e-learning. We were aiming to make three prototypes by June 2014: a customised workbook to support accessibility to e-learning with an iPad; a design workshop model driven by a social constructivist philosophy and a self assessment tool to assess readiness for e-learning activity.

With a month before the workshops, time was evaporating. Co-design around the workshop structure and content with all in1t facilitators, was not possible prior to the first planned workshop; we would have to co-design and reflect in action during the workshops.

Access to the specialist new environment was only available in June. Idealistic project planning and research inexperience across three diverse disciplines held up our progress. Additionally, through discussion of the funders report and mentors feedback, we recognised our team required another member to ensure our evaluation and feedback processes were robust. We hadn't budgeted for an ethnographer but we needed one now; which highlights the emergent nature of co-design.

2 CO-DESIGN FRAMEWORK

2.1 2011 THE BACK STORY

'This communication disability is caused by damage to the language centres of the brain. It can be as a result of a stroke, head injury, brain tumour or other neurological illness. It should be noted that intellect is rarely affected.'(*Speakability 2014*)

Before the formation of in1t, SLT's had worked collaboratively since 2000 with the PWA, their local support group Speakability, design students and staff at Duncan of Jordanstone College of Art and Design (DJCAD). Over those years participatory design methods were central to awareness raising activity about the condition of aphasia, promotion of behaviour change, and a multitude of prototyped communication resources. A project titled, Sidebyside, funded by Chest Heart and Stroke Scotland (CHSS) in 2010, highlighted the power and possibilities of tablet technology for PWA. The launch of apple's iPad signified a truly universal product of democratic appeal. Its promise to bridge the gap between mainstream technology and health authority products, became a reality within reach. The opportunity for design students and PWA to work side by side

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co-designing, addressed isolation, social cohesion and developed professional relationships between the local community and health professionals. Exploring technology through the iPad highlighted the rising demand for technology in everyone's life, but especially for PWA. Students became aware of the complexity of designing for/with others. The importance of conversations, social interactions and co-design as a tool for change were hugely significant. In this project, student and staff could see that knowledge without experience is meaningless (Skúlason 2011) and that the core values of their course, (design+people+technology) provided both effective material and immaterial strategies for social innovation.

2.2 SHARING THE OUTCOMES IN NEW PLATFORMS

The funding from CHSS supported the aim of sidebyside to investigate the use of iPads as there was low usage of digital spaces and artefacts. This intervention supported the call for action from the local aphasia community. The co-designed outcomes made with undergraduate product and interaction design students, were diverse. These included films which explored how technology could distort aural and visual communication and simulate an experience similar to aphasia (Kingsley, Hunter 2011). The aphasia community were delighted with the students public information films on You tube. As an innovative digital sharing platform democratizing aphasia. There were youthful voices linking a disconnected community together in a digital space; students + PWA = a new digital story. The need for instruction and support of digital literacy development was evident both from interactions and outcomes. SLT's began to question: can health authorities support mainstream devices within the service they provide? (ibid)

2.3 EMPATHIC ENVIRONMENTS AND EDUCATORS

The sidebyside project spurred PWA to develop their digital literacy after DJCAD intervention. SLT's sought support from the User Centre at the school of Computing at the University of Dundee, where human centred computing is key to their research.

In 2013, SLT's approached DJCAD again to discuss the progress with the new iPad group, as they faced teaching challenges supporting the follow on stage of activity. Additional to their full time workload, the health professionals teaching model was working for some but not all. SLT's had developed an ingenious prototyping system, having created and customized low-fi instructions to paired down sequences. Distributed as A4 handouts, textual content was minimal, and visual illustrations given priority. All mainstream publications were impenetrable for PWA. An alternative model of independent social learning was mooted as a pilot workshop, with aphasia friendly designed workbooks (developed from the SLT's instructions) with the ambition of developing an e-learning community.

2.4 TRANSITIONS IN COLLABORATION

To keep the momentum of previous participatory contexts of making prototypes, enacting on them and telling stories around their use going (Sanders & Stappers 2014), as members of the in1t are primarily practitioners, the It's not one thing working title was representative of the iterative process we would be using. It encapsulated the multimodal needs of our project. We were committed to developing a collaborative response to needs with a shared sense of purpose to

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drive collaboration (Taylor (2010) cited in Walsh& Khan 2010). There were a triage of needs: access to a specialist environment with trained IT support, a customised workbook for PWA and an e-learning model of workshops promoting digital literacy.

In hindsight, these were ambitious goals for the time frame. The in1t study protocol rationale stipulates that, 'we aim to make the teaching and learning experiences as effective as possible to ensure understanding is achieved, confidence increased and access to digital technology within reach.' In line with contemporary discussions of teaching roles and goals, "teaching is a creative profession not a delivery system. Great teachers mentor, stimulate, provoke, engage" (Robinson, 2014). The authors designed the workshop with this ethos.

2.5 PROJECT PLANNING TIME FRAMES

University Research and Innovation advised of our over ambition after reviewing grant applications and awards from CHSS minor research fund and the RSA catalyst fund (Royal Society for the encouragement of the Arts, manufacture and commerce). Mentors suggested that there was a tendency at this point 'to do too much'. We underestimated the learning required of our different cultures and quantity of time to have meaningful conversations. On reflection we should have had two parallel meetings, one to plan and one to develop strategy to enact. That said the team were incredibly excited to work with the new i-pad group, find freebies for the workshop bag and select memorable film clips to explore the workshop themes.

3 INNOVATIVE STRATEGIES – MATERIAL AND IMMATERIAL COMBINATIONS

The balance sought in the workshops, was to motivate current iPad members and welcome new people. Repetition of activity would be familiar to some and new to others. Resources would be designed for all facilitators to support. Design educators would facilitate from the front while SLT's would facilitate around the table. The PWA were to be consultants in the process, acknowledging their expertise and experience. Evaluation and assessment were testing the prototypes not consultant participation. We wanted PWA to tell us about the overall experience of the workshops and workbook, rather than a traditional task driven view of learning being right or wrong. 'The capacity to think intelligently is very different to knowing lots of information' (Gardner 1996). The philosophy of multiple intelligences would support a holistic view of multimodal communication and evaluation of material (workbook) and immaterial (workshop ethos) prototypes. To reach the learning preferences of our demographic, both situated learning and experiential learning were crucial to the rigors of testing the prototypes, ensuring feedback was representative of the consultants which could then drive forward accurate next steps.

3.1 EVALUATION METHODS

The models of feedback being used were collaborative methods shared from the Stanford D-School: Saturate and Group; I Like, I Wish, What if; and empathy maps. The gathering of feedback had to become a confident call and response, so a fifteen minute structure was applied to all elements of the workshop to gather feedback and to keep attention on short manageable tasks. To ensure

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that we captured the feedback rigorously, accurately and openly a visual mapping system was adopted. Responses were recorded using coloured dots attached to pictorial signs of apps, which everyone could see. This was used to capture views after demonstrations and align to the ethnographer's documentation.

3.2 WORKBOOK + PPT + SCRIPT

The workbook defined 27 actions discussed by the in1t team with the service designer. Three distinct sections emerged from the conversations as: Basic Operations, Using Media and Staying in Touch, with a final set of self assessment pages titled Can I? Questions such as: can I move between apps? Had a rating scale of hit miss maybe, and symbols thumbs up and down for consultants to assess their own progress. The sections were colour coded to distinguish between activity, progression and evaluation. Observations made by the service designer during the iPad group, helped co-development with SLT's over the quantity and sequence of images/actions in the workbook.

The use of a highly visual PPT was prepared to keep the introduction on schedule, pace the opening script and mirror actions in the workbook. It was also essential to introduce concepts such as design personas, in our case Steve, a 67yr old male who also had aphasia and was planning a journey using his iPad. These visual inclusions are essential to our innovative delivery, 'Visualizations organize information more effectively, grouping relevant elements by physical proximity or by other forms of visual cues' (Ainsworth 2014). This is exemplified when explaining complex concepts such as the role of resilience in learning with communication difficulties. A related figure who provided a playfulness to our activity was Charlie Chaplin, who's physical resilience of falling over and picking himself up and brushing himself down was a powerful representation for this task. Chaplin's tramp embodies the sentiment of resilience.

3.3 BODILY KINAESTHETIC COMMUNICATION

Games and response around nonverbal replies and gestures were key to achieving feedback and receiving response. As group mobility was varied, as much physical movement while seated at the tables was sought from each participant to ensure engagement in tasks and encourage social interaction. Much was made of the physical communication, of a hit (yes, agree), miss (no, didn't manage), maybe (I got some help, I think I could do it again, not quite sure). Early on a male consultant pointed to the miss and questioned where the Mr sign was?-humour abounded. The system established with the iPad group, drew on the Bonnington symbol system hands-a thumbs up = Hit, thumbs down = Miss and wavering thumb = undecided. Thumbs present a universal understanding in language, we used them visually on the feedback wall; on each table and as measures of achievement in the workbook. To understand the type of touch required for iPad usage, we had consultants use paint to physically emulate screen interactions.

3.4 WORKSHOP FRAMEWORK - NO CARROTS NO STICKS

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Learning can be defined as the process of making a new revised interpretation of the meaning of an experience, which guides subsequent understanding appreciation and action (Mezirow 2000)

Race (2007) states for learning to happen, 5 factors must be in place and these factors essentially occur simultaneously: a want/need to learn; the doing-practicing; repeating and the digesting of learning; making sense of what has been done; and feedback flowing from the outside to clarify. We set up a learning environment to support these factors giving practical opportunities and sense making activities. By bringing in inspirational talkers about their use of technology, we promoted multi-modal stimulation and self-belief.

All available wall space had visual content to saturate and immerse. From a graphic recording on a whiteboard; mood boards promoting learning activity; timetables and aims and objectives of work. The facilitators recognised that the 'disturbance in the minds and beings' (Barnett 2000) was a constant for PWA. All learning experiences must be designed within reach. It meant a more motivational approach, as coach, an emphasis on keeping energy high and thinking positively was an important unwritten goal of the group. Positive spins on teaching resources from films that promoted romance in the activity of sending an e-mail to Pharryll Williams's summer hit 'Happy'. Kress (2010) suggests that in a multimodal environment you should present a 'foreground of the conversation but be aware of the periphery of the conversation'. The culture of using an iPad opens up a rich and varied culture. We presented incentives like conference style bags providing an overview of in1t: Community (lanyard and printed name badge), curiosity (dish cloth), work (notepad & pen), culture (DJCAD student recipe book) and sustenance (cereal bar and water).

The environment consultants and facilitators moved around in, had been carefully customized to reflect the visual imagery in the PPT and workbook, repetition of images and ideas to promote transparency in evaluation methods. Visual prototypes provoke discussion and immerse consultants in the Design Workshop experience (Martin & Hanington 2012).

4 PROMOTION OR COMMUNICATION-MIXED MESSAGES

As the in1t team expanded it became apparent we required to redefine roles and goals of each in1t member, as the communication network expanded. Any new learning community 'must consider the purpose and goals of the activity, and to design activities to support those goals, don't assume a vision will come to fruition organically (Mackenzie 2010). (Thackara 2008) In hindsight we would ensure that written goals and role of both the group and the team were top of the agenda at the diagnostic stage of the co-design process in future activity. Promotion of in1t press and media coverage was a central activity to the rehabilitation engineer and health professionals in their roles to celebrate innovative practices. This appeared premature to design educators, before evidence or outcome.

This exemplifies the cautionary element associated with co-design and vulnerability of interdisciplinary working.

5 INNOVATION IN OBSERVATION TO TRANSFORMATION

5.1 VISUAL & AURAL FEEDBACK

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The visual recordings and inspirational talks, featuring sound cloud and Pinterest apps delivered by DJCAD students were positively received by the consultants. The benefit of using graphic recording and reflective graphics did make the invisible visible, reflect the whole and mirror content and process of the group (Kelly2005). In workshop one, consultants feedback that the workshop was going too fast, the facilitators were talking too quickly and they required more key words. We worked hard to slow things down and get positive feedback, it was recorded in the visual notes that, 'group unity' was achieved at 12.07am-it was music to our ears when everyone clapped and agreed they were back on board. 'When people can see what they are doing their learning and group analytical abilities take quantum leaps'. (Sibbet 2010, ref Kelly 2005). It was important to have imagery and music that reflected the moment. A young engaging student, with a passion for technology, making beautiful handmade utensils provided this through his work; listening to Pharyll William's summer hit *Happy* and sharing an examples of audio recordings from another student who had been teaching in Africa. We all smiled as we listened to African children singing and clapping through sound cloud.

*Clap along if you feel like a room without a roof
Clap along if you feel that happiness is a truth
Clap along if you feel like that's what you want to do (Williams 2013)*

5.2 ETHNOGRAPHERS FEEDBACK

The transformation in this workshop is from an altered perspective. Traditionally teaching and learning is evaluated and observed by other teachers. This project employed an ethnographer to observe all in1t people, their interactions and communications. The ethnographer's timeline measured:

- The facilitators seeking feedback
- Acknowledgement of feedback by facilitators
- Consultant led feedback at workshops.

The observations of workshop facilitators seeking feedback increased in workshop two. A balance between feedback sought and acknowledged became more regular, mimicking the pattern of call and response of timed activity. A stronger feedback system was emerging by workshop two. Consultant led feedback was the lowest of the three measures in both workshops, it did increase in workshop two.

5.3 CONSULTANT FEEDBACK

When asked if consultants could independently achieve the following tasks we were happy to report success. Consultants were asked if they had used the four apps introduced in workshop 1, they all agreed and continued to list a further 10-15 apps that collectively they had been using. This display of engagement could only be achieved through the collective learning amongst peers. All consultants had used the internet between workshops.

	HIT	MISS	MAYBE
Can I select text?	1	1	3
Can I take a selfie?	6	1	0

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Can I move between apps?	6	0	2
Can I send an e-mail?	5	2	1

Table 1 – Consultant self reflection on iPad tasks

5.4 CONSULTANT FEEDFORWARD

Learning from facilitators was significant. A story about teaching which was relevant to the in1t team is as follows. There are two types of teachers, those that plant the seed of learning and need to see the results immediately-they need to see the shoots. And there are the other teachers, they plant the seeds and wait. This exemplified the distinction between teaching approaches and roles of the SLT's and rehabilitation engineer, who must see the shoots, while educators in HE, (post compulsory education) plants seeds and allow learner autonomy to grow at their own speed. One SLT collating the project process, noted that the therapists work with significant others as having "unachievable ideals" and that when it is achieved it is a "challenging bonus" (Halle et al 2014 cited by Hunter 2014). While in HE the philosophy is one of personal choice, there must be a need/want to learn; convincing by carrot or stick does not help germination -'learning comes from the inside' (Mitra 2014). Some new consultants to technology were not ready for the complexity of the learning activities. However their experience remained positive due to the social aspect of learning. Consultants stated, 'the workbook allows us to talk about what we are doing and it's nice to look at and open a book'. When asked what do you love about your iPad? Consultants shared how they loved staying in touch, always learning, never alone'.

6 ADVANCED DESIGN AREAS -IMMATERIAL OUTCOMES EMERGENT LEARNING

'In design ethnography we can only research today's habits but you can use it to make informed insights about future use...Innovation is an intervention that will change future interaction'. (Saunderson 2014)

Defining what was to be captured by the ethnographer was agreed through her role and goals. The ethnographer requested an additional workshop for the facilitators to complete the project and prepare for the future. After both workshops, facilitators were asked by the ethnographer to reflect individually on their experiences of the workshop and workbook prototypes using the same feedback method -I Like, I Wish, What if. The in1t team were invited to read two papers underpinning the reflective workshop before considering the short term tactical issues and the long term strategic issues of the project through reflection and feedback. Reorganising our Likes, Wishes and What ifs, into tactics and strategies, allowed editing irrelevant thoughts and for future prototypes to begin. As a model of constructing effective conversation (Dubberly & Pangaro 2009) ethnographic inclusion gave a big picture perspective on our process, e.g. showing the plethora of accomplishments in a very short time, and mapping evidence of all actors in the project communication, highlighting time consuming activity for alteration in future interactions. The ethnographer enabled both formal and informal conversations to progress to the next stage. It is instructive that the vocabulary we were using had different meanings in different disciplines and suggesting that future designers of design scenarios have much to learn about the definitions and vocabulary they use.

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7 CONCLUSIONS

Design has the potential to make excluded people included, and inaccessible services accessible. The authors of this paper would ask that the reader view this project as a future scenario for those, trying to access a service using technology. The scenario discussed here is one firmly rooted in the experiences of people with aphasia. People who once accessed services without difficulty, now have reduced use of products embedded in services and disconnected to the social interactions these services once held and shared. The in1t model is an extreme user scenario; designing to the average provides an average service. Designing with extreme users in mind produces the inclusive service (Design Commission 2013). We need to continue to make meaning, create knowledge and understanding around digital services. Meaning is something that happens between people (Roberts 2012). To do this we need to tell stories about, through, with, of our digital activity. We need to confabulate: to talk informally and to hold discussions around co-designing digitally. Caution is required when communicating as there is also another definitions of confabulate: to fill in the gaps of memory by fabrication. We need time for storytelling, to understand our users and prepare services for extremes not averages.

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