The Italian *bricoleur* - Teaching Participatory Design in Australia

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Introduction

This paper discusses an experience in teaching Participatory Design (PD) and its application to Information Systems (IS) to undergraduate students within an Australian context and from an Italian (Mediterranean?) perspective.

This paper is divided into six sections.

The first provides some background details to help the reader contextualize the case study within its Italian-Australian domain. The second part offers an overview of the author's epistemological and ontological beliefs to better locate her teaching approach while the third part discusses her methodology. The fourth section provides a brief summary of how the teaching and learning curriculum was structured and the fifth part overviews the case study. The final section emphasizes some learned lessons from the experience.

Please note that this paper has been written in the first person, adopting a more personal approach to writing with the intention of creating a sense of familiarity between author and reader and to better portray her experiences.

Background details

I am an Italian architect and when I started working as a lecturer in RMIT University (Melbourne, Australia) I brought with me my disciplinary and cultural background, strongly rooted in theoretical, conceptual and intellectual traditions. The university where I work is on the other hand practice-oriented, and the Industrial Design Program where I lecture has traditionally been leaning towards the fashion and technological side of design[1].

The encounter between me (design is firstly about concepts and ideas) and the context where I operate (design is about aesthetics and problem-solving) has been and still is an interesting mix for a number of reasons, as it offered me the opportunity to:

- find a novel place for the conceptual and intellectual tradition I was accustomed to and influence the curriculum with a different point of view;

- discover several practice-based orientations that influenced my ways of operating; and

- mix these 2 traditions to develop innovative in-between ways of approaching curriculum development and of approaching research.

The methodology I developed through the years to teach Participatory Design and many other components to undergraduate students reflects the encounter between my 'theoretical Italianism' and my newly acquired 'practical Australianism'.

Epistemological and ontological underpinnings and influences

Gray and Malins (1993, p. 9) suggest that postmodern research methodology is a "double voiced discourse, radically eclectic" that simultaneously accepts and criticises; where traditionalism and futurism are both "honoured and subverted, embraced and eschewed, in a double process of destroying and preserving that which has gone before, towards a new synthesis".

I locate my teaching and research approach within a postmodern context and on the epistemological premise that there are many multiple ways to experience, learn about, and communicate (Burrell, G. & Morgan, G. 1979; Jipson, J.A. & Paley, N. 1997).

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[1] Australia in general appears to me to have this practice-based orientation although it manages to cultivate several different ways of approaching intellectual undertakings, possibly (but this is great speculation on my behalf) due to its multiculturalism and young history.

From an epistemological and ontological perspective, I believe my ways of operating can be interpreted as embedded in a constructivist paradigm (Denzin, N.K. & Lincoln, Y.S. 1998, p. 27) characterised by multiple realities (relativist ontology) where knower and subject can create understandings (subjectivist epistemology) and a number of naturalistic (interpretative, phenomenological, qualitative) set of methodological procedures are employed.

From a pedagogical perspective, constructivism is an evolution of the developmental work of Piaget (1978), Dewey (1916; 1973), and Kelly (1955) and looks at cognition as a mental construction. In the teaching and learning field in particular (Ausubel, D.P. 1968; Bruner, J.S. 1966, 1986; Bruner, J.S. & National Academy of Sciences (U.S.) 1960; Papert, S. 1980, 1993, 1996; Vygotsky, L.S. 1965), the learner learns through and by reflecting on experience within a framework where the context for learning plays a key role.

Within a constructivist pedagogy, I am particularly influenced by the work and methodologies of Reggio Emilia schools (Ceppi, G. & Zini, M. 1998; Reggio Children 1996) where learners create their own knowledge through questioning, exploring and reflecting (they become expert in learning and they learn how to learn) and educators facilitate both the learning and reflection processes.

Methodological perspective

The methodology I discuss in this paper is a pluralist approach to teaching Participatory Design and its applications to domains such as IS – hence it is tailored and responsive to individual projects and learners.

This methodological 'flexibility' is in line with the notion of bricoleur – a "Jack of all trades or a kind of professional do-it-yourself person" (Lévi-Strauss, C. 1966, p. 17) – that produces bricolage – emergent constructions (Weinstein, D. & Weinstein, M.A. 1991, p. 161) – adopting "whatever strategies, methods, or empirical materials as are at hand" (Becker, H.S. 1989 in Denzin & Lincoln 1998, p. 3) on the basis of the questions that are asked and on their context (Denzin, N.K. & Lincoln, Y.S. 1998, p. 3; Nelson, C., Treichler, P.A. & Grossberg, L. 1992, p. 2).

This pluralist approach sits within Reason & Torbert's (2001) notion of action turn – a returning of the "fundamental questions concerning the quality of knowing to the practice of

the knowing person in community" – where instruments of inquiry and criteria of excellence are "no longer primarily methodological" as one does no longer ask:

> is this the right method?

but instead:

> what is the quality of knowing within the practice of this person and community?

and

> what qualitative and quantitative evidence – appropriate measures, narratives, and other 'data' of both inquiry process and outcome – can be shown to demonstrate claims to quality?

The pedagogical method I adopt when teaching Participatory Design (PD) to undergraduate students evolved in time through experimentation, error, negotiation, and reassessment.

Students and peers dealing with me often seem to perceive my ways of conducting research and teaching as a *strange way of doing things* – a bricolage where many different perspectives (Italian, European, and Australian but also the interpretation of the broader design and research community as seen from Australia with Italian eyes) have been mixed together in unpredictable and at times obscure ways.

> …an *Italian Bricoleur…*

Being a bricolage, my teaching approach blends together a wide range of ways of operating, themes and tools, in particular (not in any hierarchical order):

- Reflective Practice (Schön, D.A. 1983, 1987, 1991);

- learn-by-doing (constructivist paradigms);

- wonderment and play;

- Double Loop Learning[2] (Argyris, M. & Schön, D. 1974);

- Arts Informed approaches to qualitative inquiry (Banks, S.P. & Banks, A. 1998; Eisner, E.W. 1997; Ellis, C. & Bochner, A.P. 1996; McNiff, S. 1998; Neilsen, L., Knowles, J.G. & Cole, A.L. 2001; Weber, S. & Mitchell, C. 2004);

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[2] I.e. when governing variables are questioned, implying a potential modification of such variables and how they are approached and framed up.

- Social Construction of Technology (Bijker, W.E. 1997; Bijker, W.E., Huges, T.P. & Pinch, T. 1989);

- Product-Service System approaches (Goedkoop, M.J. et al. 1999; Manzini, E. 1993a, 1993b, 1995; Manzini, E., Vezzoli C. & Clark, G. 2001; Mont, O. 2000; Morelli, N. & Loi, D. 2002; Roy, R. 2000);

- Ethnography[3] (Bentz, V.M. & Shapiro, J.J. 1998; Denzin, N.K. & Lincoln, Y.S. 1994; Hammersley, M. 1990; Hammersley, M. & Atkinson, P. 1983);

- Cultural Probes (Crabtree, A. et al. 2002; Gaver, B. & Dunne, A. 1999; Gaver, B., Dunne, A. & Pacenti, E. 1999; Hemmings, T., Crabtree, A. & Rodden, T. 2002; Hemmings, T. et al. 2002; Hofmeester, K. et al. 1999; Hutchinson, H. et al. 2003; Jääskö, V. & Mattelmäki, T. 2003); and

- Phenomenology (Bachelard, G. 1958; Dastur, F. 2000; Gadamer, H.-G. 1989).

I also tend to include in my bricolage a number of inputs from different others: other ideas (even opposing ones); other people; other ways of being and doing.

Moreover, I insert an 'informality variable', spending time and effort to build up a real one-to-one dialogue, mutual respect and relationship with each learner.

An experience

To describe the method I adopt when teaching PD and its applications to IS, I will discuss an experience that occurred in 2003 and involved second year undergraduate students which were introduced to PD in one semester and given a brief to explore it over a period of 12 weeks in semester two[4].

<u>Semester 1</u>

Students were introduced via theory classes throughout the semester to notions such as: qualitative and quantitative inquiry; User-Centred Design; the role of users in design practice; the roles of designers in today's context; Participatory Design; Ethnography and Phenomenology; and Cultural Probes (refer to phase 1 in Figure 1).

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[3] In particular, participant observer ethnography.
[4] Please note that portions of the following material have been included in some recent publications (Loi, D. 2004b; Loi, D. et al. 2004)

Students were also given a group exercise where they had to design a 'family' of Cultural Probes for a context which was analysed in theory and chosen among a series of abstract options (phase 2 in Figure 1). The main aim of this exercise was to have students directly experience the difficulty of designing probes but also to realise the importance of real people within that process.

Beside these activities students had to undertake a reflective practice exercise throughout the semester to enable Double Loop Learning (Argyris, M. & Schön, D. 1974) on the curriculum, personal reflection on tasks, and weekly based feedback. This experience has been discussed in a previous paper (Loi, D. 2004a).

<u>Semester 2</u>

Students were exposed to a range of theoretical classes on topics such as: Social Construction of Technology; Product-Service Systems; technology & IS in domestic environments; and Environmental Perspectives[5].

At the beginning of this semester students were given a brief asking them to apply PD and Cultural Probes in a real context with real users. The activity was divided into a series of phases and had a specific emphasis on the design of IS for domestic environments.

Each student had to conduct a desktop research exercise (phase 3) to unfold issues around new technologies and domestic environments – the outcomes of this research being necessary for scenario and concept development (phases 6 and 7). Beside this activity, groups of five students had to choose a number of real users sharing the same house (phase 4), design and adopt Participatory Design tools and methods including Cultural Probes (phase 5), and develop a series of scenarios for these users (phase 6). Scenarios were then developed into a series of concepts and prototypes (phase 7). Iterative processes with users had to be undertaken throughout the semester and after building a prototype, students had to iterate their designs again and re-assess them by including any further feedback (phase 8).

Between phase 4 and 8 students were asked to document their design process via a 'Group Diary'. The diary acted as a reflective journal where decisions, reflections, meetings, impressions, ideas and anything valuable to them during the process could be 'archived' to

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[5] Including: value and life-cycle analysis; design for materials; obsolescence, wear & tear, useness; sub-assembly base design; design for end life; applications of ecodesign principles; and green marketing.

facilitate reflective engagement during and beyond the experience.

Beside this activities, students had to undertake another reflective practice exercise throughout the semester (Loi, D. 2004a).
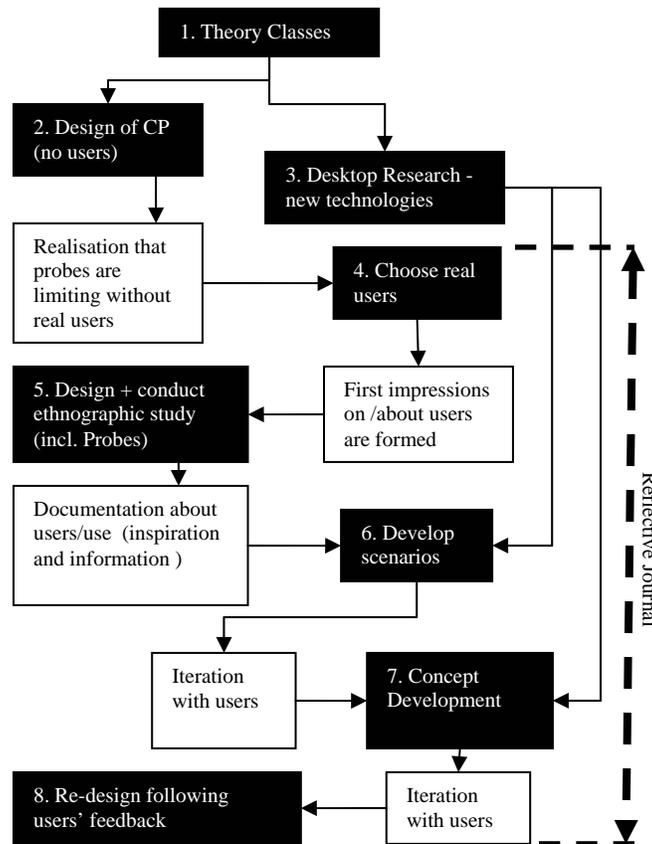
Figure 1. Teaching and Learning approach/phases

Case Study

Approaching users

Students recruited a household using a letter drop. Two hundred letters were dropped in local areas and two responses in total were received. One respondent, after scanning the brochure and translating it into voice, agreed to participate to the project, informing the group that both her husband and herself were visually impaired.

Interviews

The couple was initially interviewed separately for 45 minutes, using open-ended questions about their home and surroundings to get a feeling about their personal likes and dislikes.

One of the main findings was that their main domestic technologies were the computer and the Internet. The group however realized that when interviewed together more productive discussions would evolve and decided to modify the interview format.

Probes

As required by the brief, a probe-kit containing at least a disposable camera, a diary capturing daily activities in the home and another ad-hoc probe had to be designed by students and used by their users/co-designers.

Camera Probe

The group decided to ask users to take pictures regardless their impairment after examining disposable cameras' requirements for clear photos. As disposable cameras are auto focus as long as they are held 1m away from the object/subject, a 1m telescopic antenna was located directly under the lens of each camera so that it could act as an indicator of the minimum distance and to locate the subject in the photographic frame.

Each user was given a camera kit, differentiated by a tactile indicators, which included: the modified disposable camera; a series of questions to be scanned to an audio format (such as *Tell us about the area of your home you feel most comfortable in…* and accompany with a photograph); and a Dictaphone to enable users to describe their answers if it was needed[6].

Figure 2. Camera Probe Kit

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[6] Please note that the couple liked using the modified camera and an unpredictable outcome emerged as a consequence of its use. They subsequently decided to modify a digital camera to document their upcoming home renovations for their families who live overseas.

Diary Probe

A Tactile Diary was designed to document one evening during the week. Users were:

- asked to divide their evening into the time increments they spent doing independent and/or shared activities;

- given a can of play dough each to represent activities or tasks (the amount of time required for each task had to be commensurate with the amount of play dough used);

- asked to place the activity-sculptures into boxes with tactile markings mounted on MDF boards so that boxes could be placed on their lap when sitting on their lounge room reclining chairs (the interviews revealed it was their favorite place in the house); and

- asked to place sculptures in three different boxes: one each for individual activities and one for shared activities.
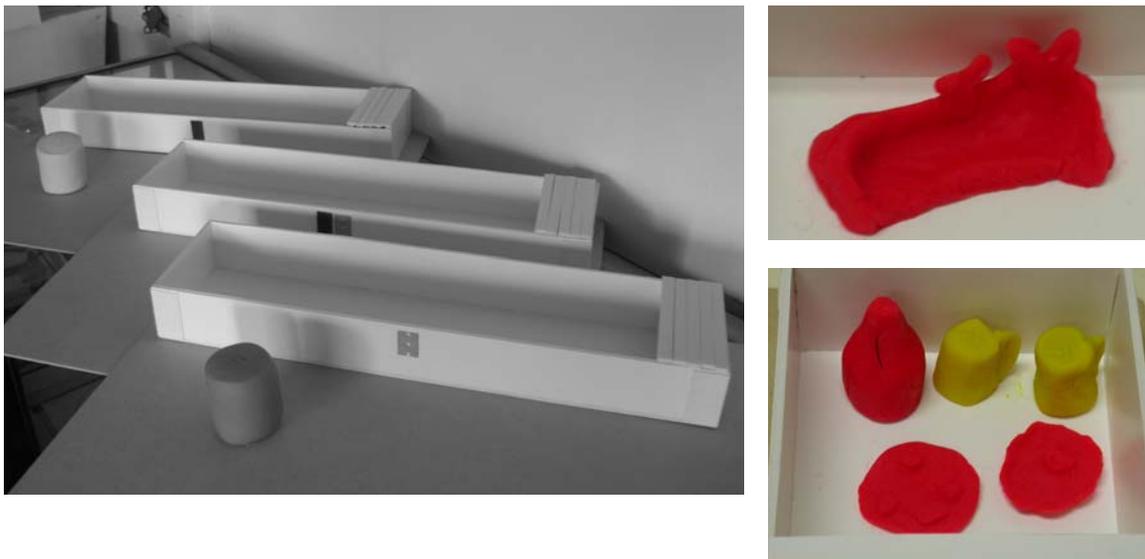

Figure 3. Diary Probe Kit and some responses

CD Probe

Two blank CDs with Braille instructions were given to users. These probes asked *Please tell us the story of your life through music and words* with the understanding that what 'the story of your life' meant was open to interpretation.
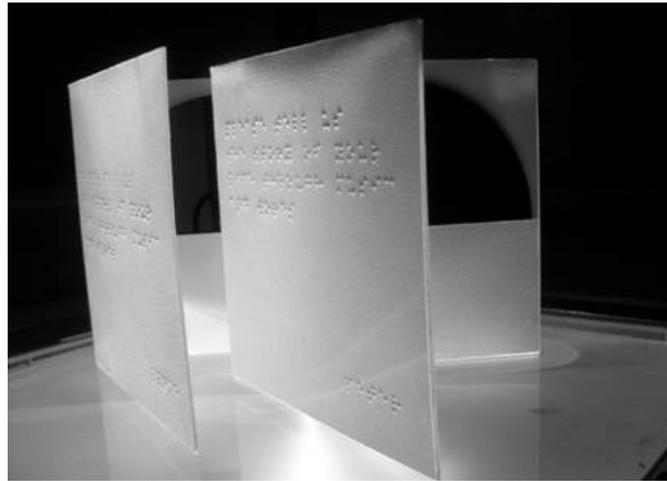

Figure 4. CD Probes

Scenarios

As required by the brief, three scenarios were developed by the group:

- a device that would translate a digital image into a 3D relief form with the ability to zoom in or zoom out of a picture – to allow users to *feel the images*;

- a system that makes it easier for visually impaired people to access and organize their music collections – to allow the creation of listening programs by combining personal collections with music from the Internet, enabling navigation via a bar code system; and

- a portable device that can translate a flat LCD display into a tactile format.

Facing the task of concept development, the group discovered that many of ideas included in the three scenarios already existed as prototypes. Consequently a new scenario was developed in consideration of some earlier comments made by the users expressing their frustration with their inability to access visual information on the products they consume.

The new scenario is a system (named www.whatthehellisthis.com) that can provide visually impaired people access to visual information on products (ingredients, cooking instructions, expiry dates, medical dosages and clothing washing instructions, etc) within the home.

<u>Concept Development and Prototyping</u>

Students decided to utilize existing technologies users were familiar with and to create a related infrastructure so information could be accessible to others with similar impairments.

On a general level the system works this way: visually impaired users scan an object via their computer; they send the scanned image to be read and identified by the service provider; and the service provider pulls up the image on their screen, reads the request, and then emails back a response.

The system would have a software package that could be downloaded from the Internet and a homepage interface with some available options: medical identification, ingredients, packaging. The system could be based in a call-center funded by government or national associations for the blind and would provide support from 9am–5pm.
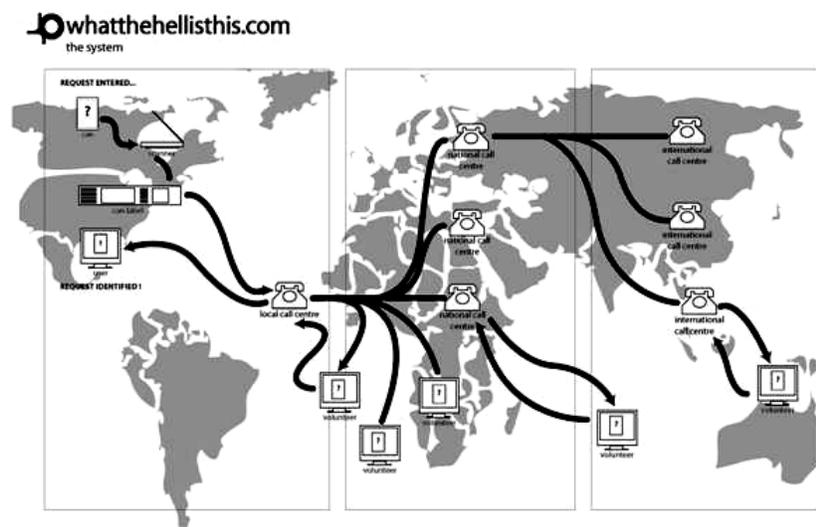

Figure 5. The whatthehellisthis.com System

The Interface

Working alongside the two users, the group developed a home page interface that is easy to navigate and capable of addressing the issues visually impaired people normally have with web pages, with special attention to icons and symbols. The team developed an interface with black text on a white background and with the type laid out in a way so users can scroll line by line (because dialogue boxes are hard to locate without sight, proving frustrating for many people with vision impairment).

The Product: Can/Scan

Scanning objects is easy in many cases although one of the main issues arises with cans as they are sealed (there is no way to feel or smell content) and as the label is printed onto a round surface. On a scanner one can create a flattened image of a can if one turns it at the same speed as the scanner light. However this is not possible for visually impaired people.

Students developed a 'frame' that sits on the scanner bed and rolls the can at the same speed as the light via two bars. The hand-rolling-technique is simulated using a phototropic electric eye. Located under the first arm, the electric eye follows the scanner light and propels the arms forward across the frame carriage, guiding the can across the scanner at the same speed as the light. This produces a flat image that is ready to be emailed and read by a sighted person at a call-center which is part of the network.
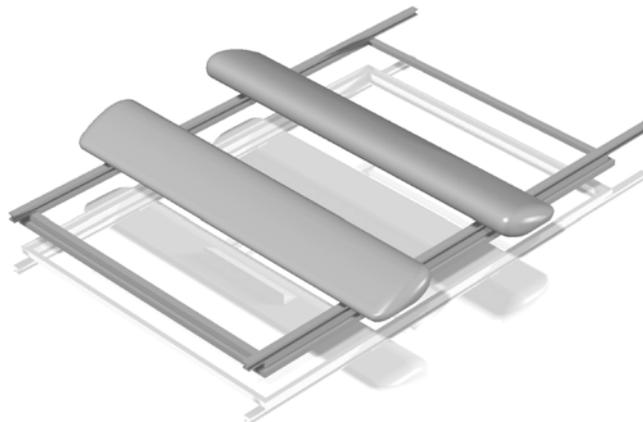

Figure 6. The Can/Scan

Conclusions

The described project has provided students with an invaluable experience in the design and use of PD methods and engaging with real users in a context previously alien to them. This context unfolded via a direct relationship with the two users that enabled student to 'know more' about their world. The design process was led by the information users gave to the group and by coming to know the two people in ways not possible using more traditional means.

In previous publications (Loi, D. 2004b; Loi, D. et al. 2004) I have discussed a number of issues associated with the teaching and learning of PD and Cultural Probes. Such issues

emphasized the complexity of roles for educators operating within constructivist paradigms.

The case study unfolded a series of reflections on the teaching and learning of Participatory Design, in particular:

- the necessity of adopting participative teaching & learning methodologies that are consistent with PD;

- the value of enabling learning processes within everyday contexts;

- the importance of engaging learners in designing processes where they need to deal with real people rather then personae or pre-determined scenarios;

- the necessity to embed in the teaching and learning process reflective mechanisms; and

- the learning potential offered to both teacher and learner.

In the first half of this paper I have discussed my epistemological and ontological beliefs, overviewing my *bricolaged* approach to teaching PD and its applications in IS.

This approach proved to act as an enabler for students to explore their own multiple realities and to create their own understandings through questioning, exploring and reflecting (constructivist paradigm). Further, the discussed methodology nurtured learners and their explorations through a pluralistic scaffold that helped them engender their own knowledge and reach a concept development and prototyping stage with their work.

I propose that this approach can lead learners toward the creation of innovative ideas (an essential asset within IS domains), providing a framework where they can explore a broad range of opportunities within a 'scaffolded' yet open-ended environment.

To conclude, I would like to stress that the experience of adopting my *bricolaged* methodology highlighted that the core value of the discussed teaching and learning activities revolved around the process (versus the outcome) of learning, teaching and designing.

In this view it could be argued that learners, educator, users and their in-between relationships were the real outcomes.

I was just following a line of inquiry, and at that point, I had to jump.

(Robert Irwin in Weschler, L. 1982, p. 65)

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