Show and Tell: Accessing and Communicating Implicit Knowledge Through Artefacts

Yoko Akama[1,3], Roslyn Cooper[2,3], Laurene Vaughan[1,3], Stephen Viller[2,3],
Matthew Simpson[2,3] & Jeremy Yuille[1,3]
[1]RMIT University, Melbourne, Australia; [2]The University of Queensland, Brisbane, Australia &
[3]Australian CRC for Interaction Design (ACID),Kelvin Grove, Australia

This paper contributes to the current discourse on the role of artefacts in facilitating and triggering interaction among people. The discussion will focus on artefacts used as part of an interview method developed in order to discover knowledge that was observed but absent from both project reports and other documentation within multidisciplinary collaborative research projects, located within the field of Interaction Design. Using artefacts in an interview context enabled participants to reveal insights that were, in turn, participatory and human-centred. Thus the method was effective and appropriate in illuminating knowledge situated in interaction. This ethnomethodological tool enabled participants to reflexively externalize their understanding of the complex interactions that occur within projects, encouraging participation, interaction, visualization, reflection and communication through the use of tools aimed at capturing and illuminating the lived experiences of human engagement. These interviews were conducted with a selection of participants, chosen because they were researchers, working together within a cooperative research centre. Keywords: best practices, consultancy, critical systems, theory, user-centered design (UCD)

Keywords: design methodology, ethnomethodology, interaction design, playful triggers

This study draws from our exploration of an interview method that uses artefacts to elicit information, and was employed to illuminate knowledge built among collaborators. That knowledge, embedded in multidisciplinary interaction design practice, was absent from project reports. In order to identify this missing information, we explored the use of artefacts based on Playful Triggers (Loi, 2005) to help visualize, communicate and capture the complex human interactions that occur within interaction design projects. *Playful*

Triggers are designed tools that both generate collaborative practices and create meaningful dialogue. As Loi describes:

> Playful Triggers generate receptive modes through their tactile, visual, mysterious, playful, tridimensional, poetic, ambiguous and metaphorical qualities. These triggers ask people to challenge taken for granted or conventional ways of doing, seeing and articulating things to co-generate shared understandings and collaborative practices. (p. 18)

Playful Triggers are a modification and extension of *cultural probes* (Gaver *et al.*, 1999) that engage users in inspirational exercises to generate ethnographic or empathetic data.

This case study involved 11 interviews with project participants within a funded research centre. These interviews were not intended to be a comprehensive survey of the research projects themselves, but rather to explore the various roles involved in interaction, as well as the experiences of collaborators through a representative sample of different projects. The intention was to illuminate human interactions, which are situated in practice (Suchman, 1987), in order to discover knowledge that was observed but absent from written documentation.

In this work, we first provide background on the research centre's projects along with a critique of their documentation procedures. We also develop the rationale for this interview method within that particular context. Second, we discuss the origins of the artefacts used in the interviews and how the use of these artefacts draws on work developed by

Loi (2005) as well as Akama's[1] ongoing research, and the work of other researchers (Arias & Fischer, 2000; Gaver *et al.*, 1999; Sanders, 2000). Examples and visuals drawn from our case study demonstrate how these artefacts were used in accessing and communicating implicit knowledge embedded in human interaction within design projects. Finally, we will discuss why the adaptation of Playful Triggers was an appropriate ethnomethodological approach in illuminating human-centred interactions in design projects. Using Playful Triggers, a physically participatory, human-centred approach, enabled participants to reveal insights that were, in turn, participatory and humancentred. As we shall show, the triggers enabled participants to communicate both *verbally* and *non-verbally* their understanding of their own roles, as well as the complex interactions and project activities that took place with others associated with the project. Using these triggers, participants were reflexively able to display their understanding of these elements to others.

We will argue that the use of artefacts in an interview context can contribute to the discourse concerning the relationship among artefacts, processes, and people. The artefacts used here effectively demonstrate that they can be triggers for reflection and imagination, tools for the articulation and communication of ideas and experience, and facilitators for participation and generative meaning-making. *Indigenous* and *introduced artefacts* play different roles within interview contexts. Introduced artefacts are objects brought in by the interviewer to facilitate the conversation, but have no particular history or association with the project. Indigenous artefacts are designed artefacts from the projects that had the language of process embedded within them. Irrespective of whether these artefacts were unfinished, as in loose sketches, or finished, as in finalised outcomes, these artefacts had specific meaning, history and context associated with them.

BACKGROUND: THE CRC PROJECT CONTEXT

A review of project documents was initially conducted to provide an understanding of the research centre's activities, and to identify potential interviewees. As a result of reviewing the project documents, the researchers discovered that those documents communicated a summary

of the projects, but that critical incidences or problems between team members within projects were not evident, making it difficult to know how these collaborators dealt with obstacles, how they identified vulnerabilities, or what the researchers might have learnt from such adversities. Issues such as unexpected leaps, tangents or breakthroughs, which often occur during a project, were neither included nor explicitly considered as contributing factors to the outcome of a project. Project documents were geared to report tasks and procedures undertaken ("we did this, we did that") in light of project order deliverables. Any reflective enquiry or articulation of project processes was absent in the documents. We observed that human-related factors that influence most collaborative projects were not documented or observed. This made it difficult for those of us who are outside a specific project to understand the complex and variable human interactions that take place when people work together, and how those interactions influence the project's final outcome.

A particular area that was difficult to comprehend through the project documents concerned how people collaborated with one another in project teams. The absence of any discussion about collaboration within a multidisciplinary context implied that the collaboration within the team might have been taken for granted. The project document successfully indicated who was responsible for which task, but failed to communicate how seamlessly, or problematically, the collaborative process was, what methods the team used to facilitate the collaborative process, and how those methods contributed to overall project objectives.

Our critique of the project documents enabled us to identify certain kinds of omitted information, which included *knowledge loss* within projects that happened when team members left the group. This missing information caused us to further explore exactly what was being captured and recorded, and what was being lost from projects in the research centre, including the collaborative processes and the methods used by group members. Afterwards, we asked ourselves if interview techniques might be used as one way of illuminating embedded knowledge regarding the processes and interactions between people. In order to develop questions that we would explore

within the interviews, we looked for *absences* in the project documents. However, as we developed these questions, we also considered that the interviewees were researchers and practitioners who worked on Research Centre projects, and were from diverse disciplines and backgrounds, including theatre, sociology, computer human interaction, engineering, industrial design, and interaction design. The diversity of participants presented interesting possible obstacles to the interview process, such as how we might construct shared meaning with participants from such different practices and backgrounds. We hypothesized that these differences might mean that other forms of non-verbal or textual communication could better support and facilitate the process of identifying the missing information.

THE LANGUAGE OF ARTEFACTS

Artefacts are considered by some as "a language of interaction" (Krippendorff, 2006, p. 46). The exploration of artefacts as another language invited us to consider that their use could complement traditional interview approaches, by facilitating conversations with the participants. While a more traditional interview emphasizes textual and verbal language as the means for facilitating conversation, we used Krippendorff 's (2006) perspective to motivate the use of artefacts as another *language element*, which might illuminate the complex human interactions that take place within projects. Thus an artefact approach was explored to capture and facilitate the fluid, temporal aspects of interaction and conversation.

The exploration of this interview methodology is being developed in Akama's ongoing doctoral work, which makes use of Playful Triggers (Loi, 2005) to facilitate conversation. Akama has explored various ways to visualize conversation situated within communication design practice. Initially, in that work, drawing and sketching reflected the language of a designer's practice, because it is common amongst many design disciplines to sketch and draw as a way to walk through thinking processes, and articulate thoughts visually (Banham, 2004; Grocott, 2005). However, in this case, not all the participants were designers. Therefore, we assumed that drawing might inhibit the flow of conversation by raising unnecessary performance anxiety. Similarly, a sense of "preciousness" associated with a blank

Figure 1.
Objects used in the interview included Yowies (Australian plastic animals), coloured matchsticks, buttons, glass beads, nuts and bolts, coloured wire, pipe cleaners, pieces of wood, and husks of seeds.

sheet of paper might restrict these participants. Furthermore, marks on paper could imply a sense of permanence that seemed at odds with facilitating a conversation based on and around people's fluid interaction.

In response to these concerns, a diverse range of objects was chosen for the purpose of facilitating the interviews. These objects are not purposefully designed, like Playful Triggers, but are a collection or modification of existing artefacts that share qualities such as being playful, ambiguous, tactile, and *everyday*. When placed in a specific context, the artefacts take on the meanings placed on them by the participants. This echoes the notion of *boundary objects* (Arias & Fischer, 2000) that act as brokering tools across disciplines, and support reflection within a shared context. Boundary objects serve as objects to support interaction and collaboration between different communities of practice. These objects involve translation, coordination, and alignment between different perspectives in order to enhance the creation of shared understanding. Furthermore, these artefacts echo Sanders's (2000) exploration of tools to "elicit emotional response and expression from people" (p. 4).

Thus, this interview context explores how people use objects for reflection, communication, and the co-creation of meaning. The range of objects used in the interviews is shown in Figure 1. These introduced artefacts included Yowies (Australian plastic animals), coloured matchsticks, buttons, glass beads, nuts and bolts, coloured wire, pipe cleaners, pieces of wood, and husks of seeds.

Figure 2.
Objects illustrated the community of people involved in a project. The Yowies often represented different people. This participant chose matchsticks, beads, and buttons to represent knowledge, expertise, and experience. Objects are behind the animals to show that each team member brought a diversity of knowledge to a project. The nut in the middle of the group represents the project.

Figure 3.
In this example of unsuccessful teamwork, two pairs of animals hide the wing nut behind them (the arrow points to that object). The participant communicated that some people on the project had not been transparent and open in sharing their findings and knowledge. The particular knowledge withheld is represented by the wing nut.

Additionally, participants were asked to bring artefacts that were indigenous to their projects. The indigenous artefacts could take any form, such as sketches, work-in-progress prototypes, or final designed outcomes that enabled them to communicate or collaborate within teams. The researchers anticipated that such indigenous artefacts would complement the use of the introduced objects during the interview by providing *multiple languages* to enrich and enhance the communication.

INTERVIEW CASE STUDY

Ten of the eleven interviews were conducted as informal face-to-face conversations modelled on an unstructured interview process. Each interview ran for approximately an hour, was audio- or video-recorded, and included photographs of the interactions between participant and artefact. The data, including transcripts, visual data, notes, and observations were progressively analysed in order to identify similarities, differences, and patterns in the interviews. We looked for these elements in order to identify implicit knowledge and interactions embedded within the projects. However, it is outside the scope of this work to focus on results concerning implicit knowledge. Rather, in this work, we focus on *how participants used the artefacts*

in facilitating and communicating tacit knowledge embedded in interaction design projects, which we argue allowed us to gather better data for analysis.

The use of artefacts facilitated interaction not available using traditional approaches where the interviewer asks questions and the interviewee answers what he or she hears. In this context, the chosen artefacts often became ice-breakers. Some participants were immediately fascinated, and touched and played with them. Others at first expressed bewilderment and puzzlement when objects were taken out of the box. One participant even stated that they "don't do things like this", and visibly communicated discomfort in interacting with the artefacts. In these situations, the interviewer often initiated the engagement by using the artefacts to clarify certain concepts that emerged during the conversation. By asking, "so, is this what you meant?" whilst moving the objects around, the interviewer invited the participant to interact during the conversation. This approach was successful with every interview. The participants then intuitively interacted with the objects and seemed to relax and actively engage with the task.

Our conversations with participants began with open-ended questions addressing the aims, roles and interactions that took place within the projects. Through narratives and storytelling, the participants shared their research experiences and provided an opportunity for the illumination of certain aspects of implicit knowledge embedded in the participant's process. Additionally, the organic and flexible
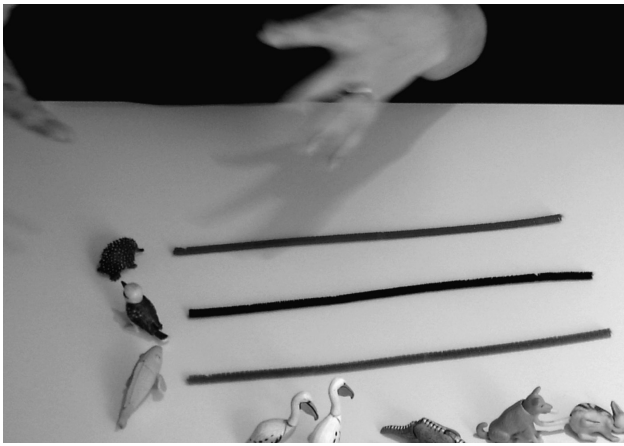
Figure 4.
This configuration illustrates communication problems. Each animal represents a different discipline, while the pipe cleaner represents each discipline's process. Distances between the positioning of each pipe cleaner communicate how different disciplinary processes were not interwoven.
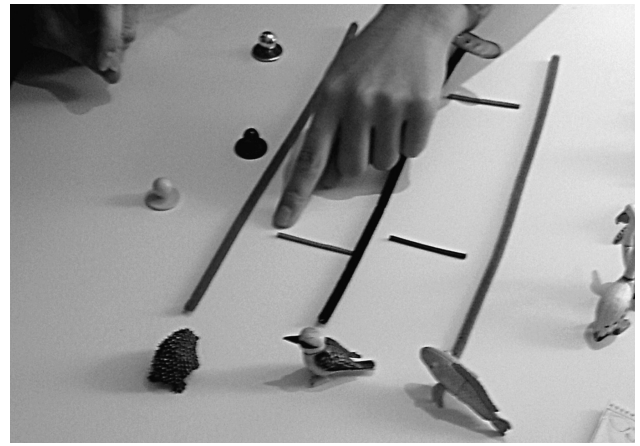

Figure 5.
This configuration shows the beginning of the collaborative process. The matchsticks represent various communication tools and methods put in place to facilitate collaboration. The finger points to an obvious gap in one area of the communication.

nature of these conversations allowed fruitful new tangents to emerge. The approach was engaging for participants, allowing them to generate and explore a variety of themes. Aspects relating to the diversity of people, knowledge, and collaborative practices were constantly illuminated within the interviews. Photographs of those interviews, shown here, illustrate how participants chose and used the objects to articulate very complex processes and interactions that occurred amongst team members.

Figure 2 illustrates the community of people involved in a project. In this case, the Yowies were favoured most to represent different people, while the objects represented the diversity of knowledge, expertise, experience, and backgrounds brought to the project. This participant chose different objects, including matchsticks, beads, and buttons to represent knowledge, expertise, and experience. Those items are positioned behind the animals to show that each team member brought a diversity of knowledge to a project. The nut in the middle of the group (circled) represents the end product that they were all working on.

Some projects suffered from a change in direction or an unsuccessful teamwork structure. An example of unsuccessful teamwork is shown in Figure 3. It illustrates a project where different nodes, represented by the pairs of animals, collaborate together. The pile of objects in the centre represents the collective work of the team. However, two pairs of animals at the top are at a distance, hiding the wing nut behind them (the arrow points to that object). The participant communicated that some people on the project had not been transparent and open in sharing their findings and knowledge. The

particular knowledge that was withheld from the team is represented by the wing nut.

The ambiguity of the objects allowed participants to represent intangible processes between team members. The following series of photographs shows how the team identified communication problems and then took steps to address them. In this project, the participants had problems communicating with one another due to the multidisciplinary team composition. Different uses of terminology within different disciplines had caused misunderstanding within project teams, which took up lengthy periods before those misunderstandings could be discovered and addressed.

Figure 4 illustrates how communication problems were identified. Each animal represents a different discipline within the team, while the pipe cleaner represents each discipline's process. Distances between the positioning of each pipe cleaner communicate how different disciplinary processes were not interwoven. Separate processes and split roles dictated the problems that the team had working together.

The way that the team began to work out a collaborative approach is illustrated in Figure 5. These developments are represented by the matchsticks, which were placed between the pipe cleaners. The matchsticks represent various communication tools and methods put in place to facilitate collaboration. However, the finger points to an obvious gap in one area of the communication.
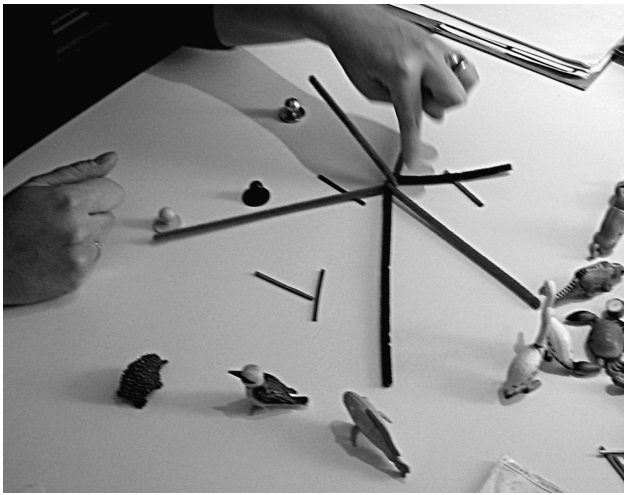
Figure 6.
This configuration shows a successful collaborative process. The pipe cleaners are not separate any longer, but instead are interwoven into a three-dimensional structure.

To address the gap, the team created systems to support shared understanding among participants without diluting the vocabulary of each field. One suggestion made by the collaborators concerned a glossary of terminologies to avoid communication problems. The last image (Figure 6) illustrates how certain activities like workshops brought people together to share their disciplinary knowledge and processes. The pipe cleaners are not separate any longer, but instead are interwoven into a three-dimensional structure. As the next section will show in more detail, by creating a greater understanding of each other's processes and languages, communication barriers gradually diminish and greater collaborative abilities result.

REFLECTIONS ON THE ROLE OF ARTEFACTS

The ways participants engaged with the artefacts illuminated significant discoveries concerning what these artefacts had enabled and facilitated in the interview context. These discoveries are discussed in detail below.

Encourages playful interaction

Our participants interacted with the artefacts in a variety of ways. During the interview, the tools encouraged playful, informative conversations and assisted participants in articulating complex roles and activities. This experience has also been noted with the use of Playful Triggers, which create dialogue between the inhabitants of an

interview setting – enabling relationships that could foster and sustain cooperative and collaborative practices (Loi, 2005). While participants can perceive a traditional interview process as formal and imposing, the artefacts were able to *break the ice*, making the interviewee feel more relaxed and comfortable in engaging with the interviewer. This sense of comfort was most notably observed in the interviewee's body language. Before the interview commenced, many participants looked serious and sometimes anxious. However, once the interviewer and interviewee began to incorporate the objects, the participants became animated and expressive. The tactile nature of each object aroused curiosity and encouraged participants to touch and play with the artefacts. Some participants were observed keeping items in their hands whilst talking – almost as a form of comfort. Some participants utilized their imagination and created certain objects to represent specific things. For example, a string of buttons represented a website.

Facilitates reflective practice

Some participants used the various physical qualities of the artefacts to brainstorm a response to a question, processing their thoughts whilst positioning the objects. For example, in one interview, the participant was observed moving the buttons and matchsticks around a Yowie in order to consider where they should be placed to represent what he intended to communicate. It seemed that the participants made use of *reflection-in-action* (Schön, 1983) as a way to formulate and articulate their thoughts. Unlike trial and error, reflection-in-action is a process that encourages reasoned and purposeful reexamination during the process of making. This process often occurs when something unusual appears as one tries to accomplish a task, which causes individuals to alter normal practice. The objects tangibly and visually reflected the participants' thoughts in action, which led to the choice and positioning of the objects. The objects were also used to re-enact conversations that had taken place among stakeholders in the projects. Through recalling particular moments, or mimicking past interactions with the artefacts, participants were observed reflecting on those particular incidents and experiences. Aided by the questions from the interviewer concerning how and why teamwork was (un)successful in their projects,

the re-enactments through the objects were not just descriptions of interactions that had taken place but also became tools for sense-making and questioning. This experience echoes the notion of using artefacts, such as Playful Triggers and visualizing through diagrams (Grocott, 2005), to assist reflective practice.

Facilitates visualization

During the interview process participants frequently used words like "this" or "that" whilst manipulating the objects to abstractly represent specific relationships, processes, and interactions, which occurred within the projects. This observation relates to a characteristic of Playful Triggers: they enable an understanding of specific settings and interactions, thereby providing nuances and/or insights that a conventional process would fail to make explicit.

The artefacts enabled an exchange of knowledge in the interviews, visually mirroring conversations as they unfolded. The Yowies frequently became people or products whilst other objects such as pipe cleaners, buttons, and husks of seeds represented directions, processes, products, qualities, or ideas. Once meaning or roles were assigned to the objects, they became visual cues for the conversations that took place during the interview. With these cues, it was easier for participants to recall details of topics touched on earlier, allowing them to jump backwards and forwards in conversation time. The objects represented moments within the conversation, and therefore facilitated the recapping and looping of ideas and concepts. In this context, the artefacts became *externalizations* to capture and articulate the tasks at hand (Bruner, 1996). The *language* of artefacts complemented the verbal words used to describe the complexities of the interactions occurring in projects. Rather than being caught up with definitions of words, debilitating the process of achieving quick mutual understanding, the artefacts enabled another form of literacy.

Facilitates co-creating meaning

During the flow of conversation, both participant and researcher would manipulate objects in order to explore the details of the interview theme. The artefacts were observed to accelerate communication between interviewers and participants, who would move each object around to clarify each other's point of view. The objects tangibly reflected conversations in which both participant and researcher had ownership but neither had claimed authoritative control. Thus, these artefacts enabled and facilitated the co-creation of meaning, in that both parties were active participants in establishing contextual meaning. The artefacts became instrumental in clarifying, articulating, and communicating tacit knowledge and activities from the participants' particular processes and interactions. In this sense, the artefacts became catalysts in engaging stakeholders in an active co-creation of meaning and experience.

Communicates relationships and interactions

The data from these conversations suggest ways that participants articulate tacit knowledge concerning their roles and interactions with others in a team. In particular, as mentioned earlier, the Yowies were frequently chosen to represent people. They became the avatars of the participants who projected either themselves or others who worked with them. This was a safe and therefore popular phenomenon, because an avatar created distance between the interviewee and his or her past experiences, allowing the ensuing conversation to be less personally charged. Similarly, instead of using the first person "I", the Yowies, such as the dingo or the koala, were used frequently when participants talked about an interaction that involved themselves and others. These animals were sometimes chosen because they reflected certain characteristics of people. For example, one participant purposefully chose an echidna, which is similar to a hedgehog, to represent a team member who liked to "dig around and fossick for ideas". Other examples suggest that participants specifically chose different kinds of animals like fish, birds, and mammals to represent not only the diversity and differences within a team, but also the obstacles and challenges that come with differences in viewpoints. In this way, the participants were observed comfortably re-enacting interactions, conversations, and relationships in projects.

Figure 7.
Workshop discussion concerns data from the interview, in which feedback within the team assists emerging thoughts.

Facilitates imagination

As stated earlier in this paper, the objects were not specifically designed artefacts for the interview purpose; they were simply a collection of objects, or modifications of existing objects. It was observed that these objects facilitated the use of a visual language for communication. This echoes a similar situation in which a concept such as the "offside rule" can be explained using salt-and-pepper shakers. In an attempt to explain this complex football rule, the table transforms itself into the football pitch and the salt and pepper shakers become the players, ball, and goal posts. By moving the objects around, the players' complex manoeuvre can be captured. We believe that the transformative ability of objects in context is something that humans acquire through play during childhood. As a child, a cardboard box can become a boat, a house, or a car simply by imagining its role in the story being told. In discussing *transitional objects*, Winnicott (1974) describes how objects can be possessed by the child's imagination so they are neither fully part of the self nor explicitly external. He further explains that in playing, "the child gathers objects or phenomena from external reality and uses these in the service of some sample derived from inner or personal reality" (p. 51). Similarly, these objects were found, collected, or modified, because they embodied a certain playful feel. Yet, in this specific context, these ordinary and playful objects enabled people to project their imaginations, to design, as it were, something else in the stories that they told.

Enables communication design

The artefacts provided a catalyst for the participants to design rudimentary communication pieces. Various objects were orchestrated, constructed, arranged, and manipulated in order to assist communication during the interview. This process reflects situations and outcomes in design

where objects became triggers and catalysts that enabled the communication and co-creation of meaning. Because the resulting orchestration of objects was photographed and captured in succession, these photographs became firsthand *visual quotes* to convey and demonstrate certain themes, which helped us develop the interview report and extrapolate the findings.

These photographs were particularly effective in a workshop conducted to convey the interview findings to the rest of the research team. Photographs similar to the ones shown in this paper, along with audio- and videorecordings, aided the process of reflecting and communicating our findings to the rest of the team. During the workshop, each photograph became a rich source of information that communicated various aspects of the collaborative process. Information from the interviews was shared by grouping quotes, notes, and photos under themes that began to emerge from the data. We asked the group to add their thoughts, additional themes, and questions in response to the display (Figure 7). The feedback and discussion within the team assisted additional emerging thoughts.

The role of indigenous artefacts

The researchers observed that indigenous design artefacts from the projects themselves had the language of process embedded within them. Sketches, photographs, presentation slides, and design prototypes that the participants brought were discussed during the interview. Using these project-specific artefacts as triggers for discussion provided the researchers with an enriched understanding of the participants' collaborative process undertaken during the project. Prototypes and work-in-progress artefacts were particularly useful in triggering conversations around process and collaboration, because we could then identify *how* collaborators developed the project, *who* made the project, and *why* the project came to be. These conversations revealed exploratory avenues, failed attempts, and breakthroughs that had occurred during the collaborative process.

Because the knowledge embedded within an artefact is rarely made explicit, it can only be accessed and communicated by those who can interpret it (Tonkinwise & Lorber-Kasunic, 2006). Therefore, we asked the participants to explain in great depth why the chosen artefacts were a valuable part of the design process, and how those artefacts had facilitated collaboration amongst the

team. Some participants revealed how prototypes became a focal point around which team members could come together with their diverse expertise. For example, a prototype of an interactive device facilitated discussion in a group that included an industrial designer, an engineer, a software developer, and an interaction designer, who could effectively critique that shared concept in order to propose different directions. Others commented on how sketches and photographs captured certain processes and served as visual reminders of the discussions that had taken place between team members. The articulation and externalization of this knowledge transformed each artefact in terms of how it was interpreted and understood by the researchers. Embedded meanings and layers of knowledge were revealed that transformed items, such as a loose sketch, into a strategic organization of information.

CONCLUSION
In conclusion, through this case study, we discovered that artefacts were an appropriate ethnomethodological tool for illuminating human-centred interactions in processes and projects. The participatory, human-centred methodology embedded in these artefacts enabled participants to reveal and illuminate insights, which were, in turn, participatory and human-centred. These artefacts enabled each participant to communicate an individual understanding of complex interactions with others from within, and reflexively display their understanding of those interactions to others.

These interviews became a way to explore the different kinds of artefacts and the roles they play. In particular, we observed differences between the roles played by indigenous and introduced artefacts. As stated earlier, indigenous artefacts emerged from the projects themselves embedded with a language of process. Irrespective of whether they were unfinished loose sketches or finalized outcomes, the participant could read a specific meaning, history, and context and share it with us. However, the introduced artefacts, which were objects brought by the interviewer to facilitate the conversation, had no particular history or association. Those artefacts allowed us to co-create contextual meaning with the participants.

We believe that the different roles indigenous and introduced artefacts contribute will provide an interesting area for future exploration.

Finally, the use of artefacts in an interview context broadened their role as catalysts in facilitating, triggering, and enabling interaction among people. By encouraging reflection and imagination, acting as tools for the articulation and communication of ideas and experience, and facilitating participation and generative meaning-making, artefacts add an important dimension to traditional interview techniques.

NOTE
1. Akama's doctoral work titled *The Tao of Communication Design practice*, undertaken at the School of Applied Communication, RMIT University, Melbourne, is due for completion in 2008.

REFERENCES
Arias, E. Fischer, M. (2000). *Boundary objects: Their role in articulating the task at hand and making information relevant to it.* Paper presented at the International Symposium on Interactive & Collaborative Computing, University of Wollongong.

Banham, S. (2004). *Mixed business: Integrating value systems with graphic design practice*. Melbourne, Australia: RMIT University.

Bruner, J. (1996). *The culture of education*. Cambridge, MA: Harvard University Press.

Gaver, B., Dunne, A., & Pacenti, E. (1999). Cultural probes. *Interactions, 6*(1), 21–29.

Grocott, L. (2005). *Promoting potential: The dissemination and reception of practitioner-led design research*. Paper presented at Design Perspectives Conference, Universidad Iberoamericana, Mexico.

Krippendorff, K. (2006). *The semantic turn: A new foundation for design*. Oxford, UK: Taylor & Francis.

Loi, D. (2005). The book of probes. Lavoretti per bimbi: Playful triggers as key to foster collaborative practices and workspaces where people learn, wonder and play. Unpublished doctoral dissertation, RMIT University, Melbourne.

Sanders, E. (2000). Generative tools for codesigning. In Scrivener, Ball, & Woodcock (Eds.), *Collaborative design: Proceedings of CoDesigning 2000* (pp. 3–12). London: Springer-Verlag.

Schön, D. (1983). *The reflective practitioner: How professionals think in action.* New York: Basic Books.

Suchman, L. (1987). *Plans and situated actions: The problem of humanmachine communication.* Cambridge University Press.

Tonkinwise, C., & Lorber-Kasunic, J. (2006). What things know: Exhibiting animism as artefact-based design research. *Research into practice conference: Working papers in Art and Design, Vol. 4: The Role of Context in Art and Design Research* (pp. 1–14). Hatfield, UK: University of Hertfordshire.

Winnicott, D. W. (1974). *Playing and reality.* London: Reaktion Books.

CORRESPONDENCE:

Yoko Akama,
School of Applied Communication,
RMIT University,
GPO Box 2467V,
Melbourne, Victoria 3000, Australia.
E-mail: yoko.akama@rmit.edu.au