

Moving Beyond “Just Tell Me What to Code”: Inducting Tertiary ICT Students into Research Methods with Aboriginal Participants via Games Design

Dianna Hardy

College of Business, Law
& Governance

James Cook University
dianna.hardy@jcu.edu.au

Elizabeth Forest

College of Business, Law &
Governance

James Cook University
elizabeth.forest@my.jcu.edu.au

Zoe McIntosh

College of Business, Law &
Governance

James Cook University
zoe.mcintosh@my.jcu.edu.au

Trina Myers

College of Business, Law
& Governance

James Cook University
trina.myers@jcu.edu.au

Janine Gertz

Indigenous Centre
James Cook University
janine.gertz@jcu.edu.au

ABSTRACT

Many Aboriginal languages are becoming extinct due to lack of fluent speakers. Computer games offer a way to help teach these languages in a fun and engaging way. However, computer games like all technology objects are based in the culture of their creators. In this paper we describe a project where we co-designed a language application for mobile phones with the Gugu Badhun, an Aboriginal community from north Queensland Australia. The participatory action research process allowed our Aboriginal partners to embed their own culture in the games, leading to a product that supported their goals and aspirations for language renewal. This collaboration has not only provided a way to sustain their language, but also added capacity to their community in ICT development. This paper contributes to HCI literature by delineating a respectful approach to collaborating with Aboriginal participants.

Author Keywords

Language revitalisation, co-design, Indigenous Knowledge

ACM Classification Keywords

H5.m. Information interfaces and presentation (e.g., HCI): Miscellaneous.

INTRODUCTION

Common advice given to new technology developers is to always remember that we are not designing for ourselves, but for others (Stappers, 2009). ICT professionals must bridge the communication divide that exists between

Permission to make digital or hard copies of all or part of this work for personal or classroom use is granted without fee provided that copies are not made or distributed for profit or commercial advantage and that copies bear this notice and the full citation on the first page. Copyrights for components of this work owned by others than ACM must be honored. Abstracting with credit is permitted. To copy otherwise, or to publish, to post on servers or to redistribute to lists, requires prior specific permission and/or a fee. Request permissions from Permissions@acm.org.

OzCHI '16, November 29 – December 2 2016, Launceston, TAS, Australia

Copyright © 2016 ACM 978-1-4503-3673-4/15/12... \$15.00
<http://dx.doi.org/xx.xxxx/xxxxxxx.xxxxxxx>.

technologists and everyday users of technology (Koskinen, et al., 2003). The situation where the research team is working with members of other cultures makes this proviso even more challenging, especially when working with members of marginalised groups such as Indigenous people (Madden, et al., 2012).

A trainee researcher must be able to tolerate ambiguity and uncertainty at many stages during the study process. Information and Communication Technology (ICT) training at the undergraduate level of university prioritises the implementation of a product based on a set of precise instructions with all students completing the same or similar projects. Industry is increasing valuing teamwork, problem-solving and communication skills in the graduates that they hire and university programs are beginning to implement subjects that prioritize these skills along with technical acumen. Due to the short-term nature of the semester, many ‘introduction to research’ units either consist of an extended literature review or comprise a theory based unit describing research methods. These constraints mean that although real world projects with clients outside the university may be completed, they lack the time needed for in-depth qualitative research. Additionally, it is also quite rare for such projects to include Aboriginal participants.

This paper reports on a research project conducted at James Cook University in Townsville, Australia with a team composed of the first author (a lecturer at that university), two third-year Bachelor of Information technology students, and three Aboriginal participants from the Gugu Badhun (one of whom is the last author). The aim of the research was two-fold: (a) to give the students a practical introduction to the concepts and processes of research and (b) to investigate the possible benefits of co-creating a smart phone game to help sustain the original language of the Aboriginal participants. Outcomes of this project included knowledge transfer between the team members in the areas of Aboriginal cultural heritage and digital games design.

The purpose of the project was to develop a mobile phone based language teaching mobile application that both children and adults of the group could use to learn the Gugu Badhun language. The group planned to make it available to be deployed on mobile devices so this knowledge could be widely available within their group.

BACKGROUND

The Gugu Badhun originally inhabited the area around present-day Greenvale, a town in North Queensland, Australia. Due to lack of work opportunities in the area, most the group are not able to live on their home country, and have moved to other towns and cities. However, the people still feel a strong connection to, and responsibility for their traditional lands and culture (Madden et al., 2012). As an after effect of colonialization this language currently has no remaining fluent speakers. The group’s ancestors were forbidden to speak their language to assimilate them into non-Indigenous society and any elders who retained fluency in the language have died (Reynolds, 1999, Sutton, 2009). In the 1970s, a few of the remaining language speakers worked with linguist Peter Sutton to create a dictionary and linguistic description of the Gugu Badhun language (Sutton, 1973). In 2004, the group employed a local firm to create a CD to convey cultural information as well as audio recordings of the spoken language. Only a few copies of the CD exist due to the expense of copying CDs and distributing them at that time, which has made learning and practicing their language difficult for members of the group.

The Gugu Badhun people are highly invested in revitalising their language as much as is possible. However, having only a small number of people who can speak a smattering of the language presents a problem in sustaining its longevity and use over time. The creation of the language game means that those few language speakers do not have to be present to convey the knowledge contained within it. The interactive nature of the product provided them with a quick mechanism to reinforce how they learn the words. Moreover, the game was not aimed at a particular age group, which is different to some products aimed at a specific market.

DESIGN PROCESS

Participative frameworks offer the opportunity to reduce the power structures between researchers and participants. For this project we used Participatory Action Research (PAR) as a co-design method to include the entire research team in all decision-making and design activities. PAR, has a long history of use with disadvantaged groups in order to assist them to improve their living conditions (Kemmis and McTaggart, 1988, Liamputtong, 2009).

During the length of the study, the students offered information regarding design of software, and the Aboriginal members of the team conveyed knowledge about their cultural heritage and language. Table 1 below shows the stages of the collaboration. It should be noted

that all activities occurred within the very short time-frame of a single university semester (roughly 3 months).

| Activity | Week |
|-------------------------------|------|
| Initial focus group | 2 |
| Focus group 2 | 4 |
| On country + paper prototypes | 6 |
| Digital prototype iteration 1 | 8 |
| Digital prototype iteration 2 | 10 |
| Delivery and handover | 12 |

Table 1 - Design Activities

The first stages of the study involved meeting with the prospective team members to understand the purpose of the game and who the final users of the game might be. This introduction allowed the team to state their aspirations for the project not only as a student research study but as a tangible item that would be handed over to the community. The Gugu Badhun and the non-Aboriginal members of the team developed a working relationship based on the respect and acknowledgment of shared knowledge transfer to ensure that the research occurred in a culturally safe space where all opinions were accepted and valued. At times this included various members explaining either ICT terms or cultural ones.

The students met with the entire group fortnightly, and with the lead IT researcher every week. These weekly meetings served several purposes. Firstly, the meetings were a pragmatic way to stay on top of deadlines the students were encountering. Secondly, the students had a space to ask the questions regarding culture that they might be too timid to ask in a face to face meeting with the larger group. The students reported a significant fear of missing some cultural cues and “saying the wrong thing”. Thirdly, the meetings provided an avenue for the primary researcher to provide mentoring services to help the students work out next steps and keep the project in scope. All of these actions are skills that researchers develop over time, but are sometimes difficult to convey in other than a theoretical fashion. The pragmatic nature of the study allowed these concepts to be taught in a just-in-time fashion.

A significant activity that occurred during the study was a weekend field trip to the traditional country of the Aboriginal participants. During the four-hour drive to the area, the students received an in-depth introduction to the participants’ lifestyles, interests and motivations. Most members of the Gugu Badhun live at some distance from their “country”, but still feel a deep connection to the land. Upon arriving, the students were introduced to community members still residing in the area, and over the course of the day were taken around to important places in the landscape in order to give the students a grounding in the place where the language for the game arose. The group felt that it was very important for all of the research team to understand the context in which the design work would fit and to begin to understand the group’s connection to the land.

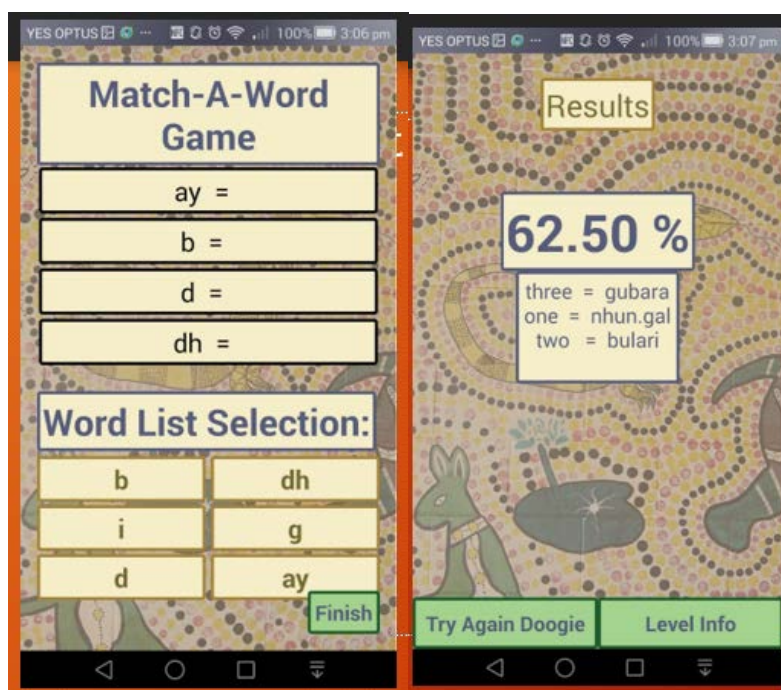
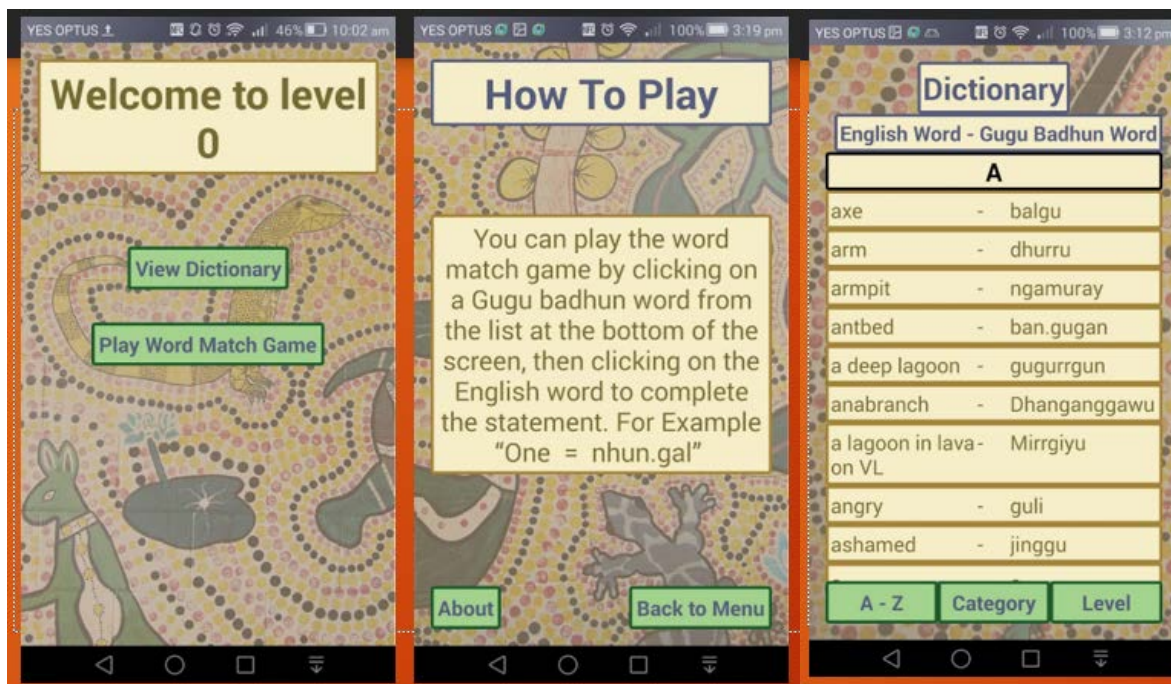


Figure 1 - Key screens in language game: Match-A-Word game and results screens:
 Top left: Welcome, Top middle: Instructions, Top right: Dictionary
 Bottom left: Match-A-Word, Bottom right: Results

During the on country trip, the students demonstrated two paper prototypes they had developed. By producing two separate interfaces, the students offered the group the opportunity to mix and match functionality ideas to give the larger group a view into what was possible. These first tangible artefacts were greeted with excitement as the larger research group could see the project rapidly progressing. Based on the feedback received on the prototypes, the students were able to build a digital prototype combining the best aspects of each design and then implemented that prototype as a completed game

playable on an Android phone. The game was distributed on USB sticks to community members rather than publishing it to the Google Store to maintain control of the cultural heritage elements contained in the application.

DESCRIPTION OF GAME

The language game is an Android application created using Android Studio. The game contains a login screen, a dictionary with audio pronunciation of words, a game demo, and 34 levels which contain a total of 270 words. Key screens from the game are presented in Figure 1

above. After logging in the player has the opportunity to either start the Match-A-Word game, or to view the dictionary. After choosing the matching game, the next panel shows a new set of six words for that level where the user attempts to match the Gugu Badhun word to the English counterpart. The user must achieve 100% on each level to advance to the next. In addition to progressing through the levels, users can accumulate badges for various activities such as words learned as well as unlock video content taken from the original language CD. The game uses Aboriginal slang terms such as “Too deadly” for 100% and “Try again doogie!” for a less than stellar score (doogie being an affectionately chiding term for a silly person).

CONCLUSION

The Gugu Badhun Language game was designed and developed in collaboration with community members. The co-design of this product was reciprocal with designers and Gugu Badhun members coming to easy agreement, each valuing the others’ input (Smith, 2012). The ongoing, close interaction between the technologists and the Gugu Badhun enabled respectful engagement in understanding the cultural context which was then embedded in the game design.

The research team used participative action research methods to jointly design how the game should function and what content should be displayed as the player journeyed through the game. Additionally, the team sought input into the design from Gugu Badhun young people who are active participants in games both mobile and online. Having this input from younger people empowered them to have a say in the design (Van Rijn, et al., 2008). In order to provide context for the project, the Aboriginal members took the team to their traditional country to experience their history, language and stories. During the project, the team used drawings and sketches as low fidelity products to show their thinking process throughout the design and development of the game to ensure that all members of the project could participate equally.

This project resulted in significant knowledge transfer between the researchers and the participants, the Gugu Badhun people. The participatory nature of the project facilitated a collaborative approach to decision making in all steps of the research process. This included input into the concept, research design, methodology, and knowledge translation strategy. The Gugu Badhun participants and the wider Gugu Badhun nation benefited in several ways; by a tool to assist in the practical revitalization of their language; gaining more knowledge about the opportunities offered by technology in maintaining cultural heritage; and building early research capacity in Gugu Badhun youth who participated in the project. Benefits for the principal researcher included further strengthening of research capacity in Indigenous research and the student researchers gained knowledge and initial experience in conducting research in an Indigenous context. Underpinning this was the ‘on country’ experience of researchers and participants being on Gugu Badhun land sharing information about history, kinship and deep connection to land and water

which provided context for the researchers. Involvement in the project has led to Gugu Badhun people investigating how else technology can assist them in recording and preserving their history, language and culture and contemporary matters of interest.

While the study itself was considered a success by the group, there is still further work that needs to be done before the language application can have wider distribution within the group. Two key limitations of the implementation of the project are still to be resolved, both connected with accessibility of the product. The first is that the application is currently only available to operate on Android phones. Many members of the community use iPhones, therefore before there is wider uptake of the application an IOS (iPhone) version will need to be created. Due to the extremely limited time period of the project this restriction was not able to be overcome. Second, the Gugu Badhun members of the group were not comfortable with releasing the Android application via the Google store, making it more difficult for it to be installed on member phones. The application is available via installation from a computer, but at present this restriction limits the distribution of the application. The group’s concerns regarding potential loss of intellectual property are valid and significant making this a more challenging decision than was obvious from the outset of the research.

Instructing students how to conduct research, like any other teaching activity requires advanced planning. Adding in the complexity of dealing with dual cultures requires a sensitive and respectful approach. Digital games, like all other technology objects reflect the culture of their creators. Salen and Zimmerman [8] emphasize that “games are culture...The Sims is not merely a simulation of suburbia, but a representation of cultural interaction that relies on an ideological reality located beyond the scope of actual game play” (p. 507). By involving a group in the design of a game that reflects their culture, we help ensure that the underlying norms of that culture are embodied within [9]. Co-developing a game with a cultural focus, i.e. a game that focuses on the culture of a given group, avoids the problem of stereotypical representation in the larger non-indigenous society. Indeed, Shaw suggests that while complete non-representation in the video game market is better than stereotypical representation this lack of presence leads to the increasing invisibility and lack of voice in the wider gaming community [9]. Facilitating Indigenous partners to create games that reflect their own culture gives them increased “voice” and presence in the dominant culture (Anderson & Courtney, 2011).

REFERENCES

- Anderson, N., and Courtney, L. (2011). *Students using Indigenous knowledge in video game creation to develop design thinking skills*. In: Felicia, Patrick, (ed.) *Handbook of Research on Improving Learning and Motivation Through Educational Games: Multidisciplinary Approaches*. ISI Global, Hershey PA, pp. 806-819.
- Bull, J.R. (2010). *Research with Aboriginal Peoples: Authentic Relationships as a Precursor to Ethical*

- Research. *Journal of Empirical Research on Human Research Ethics: An International Journal*, 5(4), 13-22.
- Kemmis, S., and R. McTaggart, eds. (1988). *The Action Research Planner*. Victoria: Deakin University.
- Koskinen, I., Battarbee, K., Mattelmäki, T. (Eds.), *Empathic Design*, IT Press, Helsinki (2003).
- Liamputtong, P. (2009). *Qualitative Research Methods*. 3rd ed. South Melbourne: Oxford Press.
- Madden, D., Cadet-James, Y., Atkinson, I., and Watkin Lui, Felecia (2014). *Probes and prototypes: a participatory action research approach to codesign*. *CoDesign*, 10 (1). pp. 31-45.
- Reynolds, H. (1999). *Why weren't we told*. Penguin Books.
- Salen, K. and Zimmerman, E. (2004). *Rules of Play: Game Design Fundamentals*. Cambridge:MIT Press
- Shaw, A. (2009). Putting the Gay in Games: Cultural Production and GLBT Content in Video Games, *Games and Culture*, 4(3):228-253.
- Smith, L.T. (2012). *Decolonizing methodologies: Research and indigenous peoples*. 2nd ed. New York;London;: Zed Books.
- Stappers, P.J. (2009). Designing for other people's strengths and motivations: Three cases using context, visions and experiential prototypes. *Advanced engineering informatics*, 23(2):174-183.
- Sutton, P. (1973). *Gugu-Badhun and its neighbours: A Linguistic Salvage Study*. (MA Master Thesis), Macquarie University, Sydney.
- Sutton, P. (2009). *The politics of suffering*. Melbourne University Press: Melbourne, Australia.
- Van Rijn, H., Stappers, P.J. Motivating users in a codesign process, in: *Participatory Design Conference, 2008*.