Children as e-designers:
How do they understand learning?

A thesis

submitted in fulfilment

of the requirements for the Degree

of

Doctor of Philosophy

at the

University of Technology, Sydney

by

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University of Technology, Sydney

2007

Certificate of authorship/originality

I certify that the work in this thesis has not previously been submitted for a degree nor has it been submitted as part of requirements for a degree except as fully acknowledged within the text.

I also certify that the thesis has been written by me. Any help that I have received in my research work and the preparation of the thesis itself has been acknowledged. In addition, I certify that all information sources and literature used are indicated in the thesis.

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Acknowledgements

The recent learning journeys of the university researchers, school partners and children who formed Team GENESIS are woven together throughout this thesis.

Now that I have seen and tasted learning as children know it, I recognise more clearly and appreciate more deeply the value of my recent travels. The children's view of learning made known to me the significance and worth of seeking understanding as a part of a learning community. I wish to make known my appreciation and regard for the communities that I was fortunate enough to be a member of during the past four years.

Working with the UTS Research Team enabled me to participate in many exhilarating conversations with Associate Professor Dr. Lynette Schaverien, Professor Shirley Alexander and Dr. Robin Hall. Their commitment to children's learning and their vision for the evolution of education is an inspiration to me. It was my particular privilege to again become Lyn's research student. Her committed involvement in my learning journey strengthened and refined my ideas and understanding.

Each month, when the school partners met, we not only wrestled with the challenges such a project brings, but shared our growing interest in learning - the children's and our own. I would like to thank Karen Cuthbert, Norm Nicholson, Serena Vecchiet, Cathy Hill and John Tomkins for their willingness to share, listen to and engage with so many ideas about learning 'and school. Warren Poole's resolute support of innovative learning opportunities for his students and staff is both a personal and professional encouragement.

Working with Team GENESIS introduced me to more than 400 remarkable children. Cameron, Hamish, Shaun, Max, Josh, Natalie, Hannah, Alyssa, Melody, Marie Claire, Matt, Kirsten and Ashleigh's stories are the few I chose to share in detail of so many important and interesting journeys.

The story this thesis doesn't tell is of the community of people who shared a very different journey with me. The love, support and prayers of my parents, Heather, Jon, Scott, Rochelle, Megan, Lisa, Scott, Lucy, Di, Doug and Ruth have taught me the strength of patience, the warmth of encouragement, the comfort of service and the truth of God's goodness. To have you walk alongside me was my very great privilege. Thank you.

Nerida McCredie, Sydney, 2007

Preface

The following publications and conference papers are related to this thesis:

Alexander, S. (2004). Learners creating the learning environment. In M. Selinger (ed.) *Connected Schools - Thought Leaders: Essays from innovators* (pp. 26-33). London: Premium Publishing.

Schaverien, L., Hall, R., and Genesis Team. (2006). A Case Study - GENerating Learning Systems in Schools (The GENESIS Project). An Australian Research Council Linkage collaboration between the University of Technology, Sydney (UTS) and three partner schools in Sydney, NSW, In Chapter Six Assessment and Reporting with ICT: How do teachers know what students have learned? (pp. 209-212) In G. Finger, G. Russell, R. Jamieson-Proctor, and N. Russell, (2006). *Transforming Learning ICT: Making It Happen.* Frenchs Forest NSW: Pearson Education Australia.

McCredie, N. (2004). e-Design for a learning journey: A contemporary encounter with students' ideas about how and why we think. Paper presented at the pre-conference doctoral consortium of the International Conference of the Learning Sciences, Santa Monica, Ca, June.

Schaverien, L., Hall, R., McCredie, N., Alexander, S., Hill, C., Tomkins, J., Nicholson, N., Cuthbert, K. and Vecchiet, S. (2005). Can we help e-Iearning to scale up in schools by casting students as e-designers? The GENESIS Project. Paper presented to the Australian Association for Research in Education annual meeting, University of Western Sydney, Parramatta Campus, 27 November - 1 December. [accessed on 3 March 2006 at http://www.aare.edu.au/05pap/alpha.htmJ.

Hill, C., Alexander, S., Cuthbert, K., McCredie, N., Nicholson, N., Schaverien, L., Tomkins, J. and Vecchiet, S. (2005). GENerating E-Iearning Systems in Schools: School-university e-Iearning research partnerships for scaling up innovation. In S. Lee, P. Warning, D. Singh, E. Howe, L. Farmer, & S. Hughes. IASL Reports, 2005: *Information Leadership in a Culture of Change.* Selected papers from the 34th annual conference of the International Association of School Librarianship and ninth International Forum on Research in School Librarianship, Hong King, China, 8-12 July 2005 [CD-ROM], (Section 19: pp. 1-7). Erie, PA, USA: International Association of School Librarianship.

Note

In this thesis, reference is made to several sources which were written before authors were conscious of the need for inclusive language. I acknowledge this collectively in advance.

Many of the contributions that children posted online were written in shortened text format. While spelling mistakes have been corrected, words and phrases written in their abbreviated form have been left intact.

Since there is a wealth of short quotations from a large range of sources, including discussion boards, brainstorms, videos, reports, interviews, posters and other work samples, precise details of time and date have not been included for every instance. Instead, children's names are given, acknowledging their contributions, and in most cases, the source of the quotation is identified.

Table of Contents

Chapter Seven

Chapter Eight

Chapter Nine

List of Tables

List of Figures

Abstract

This thesis reports an investigation into children's understanding of learning, as they engage with an e-Iearning design challenge.

It begins by making a case that children's views of learning are of crucial significance, not only because of their position as pre-eminent learners in families and societies, but also because their learning is at the heart of our culture's aspirations for education. Then, it examines a selection of prior studies of learning in e-design contexts in order to gauge the advantages of seeking the views of children about learning in an e-design context. This consideration revealed the technological and educational potential of e-design, suggesting that such a context would be opportune here.

Fortuitously, a large, ARC-funded Linkage Project (GENESIS - Generating e-Iearning Systems in Schools) provided just such an e-design context. In this project, researchers were keen to investigate whether the slowness of schools in appropriating e-Iearning might be offset when students have a sustained opportunity to conceive, design and, as far as possible, build an e-Iearning environment in which they and other students could explore questions they were passionately curious about. As a case study within the GENESIS Project, this study followed Papert's (1973) five-step process of educational research. First, a theory of education (a biologically based generative theory) was selected. Next, the ensuing set of conditions for the intellectual growth of children (the e-Iearning design challenge itself) was laid out. These conditions were then implemented within the context of The GENESIS Project: the children were equipped with the opportunity and resources to design an e-Iearning environment to explore a science-and-technology topic of their choice *(How and why do* we *think? How come we're not born with the knowledge we know now?).*

Of the large set of project data, six accounts were selected as representative of the diversity and commonality of children's learning and their understanding of learning in this study. Findings revealed that these children understand learning as generating, testing and thereby modifying ideas, they appreciate that these events are influenced by each leamer's values and they recognise value in undertaking this knowledge gaining activity as part of a learning community. Furthermore, these children explicitly enact opportune learning experiences, particularly technologically, demonstrating their fluency as technological thinkers, capable of having technological ideas about learning.

The findings of this study reveal that these children are able to make their views of learning known, both in conversation and by way of sophisticated characteristics of their e-designs. They highlight the need to canvas and hear children's views about the nature of an education that is in their best interests, and to support their demonstrated capacity to shape such an education technologically for their era.