Participation, teachers and technology in the classroom

Keir Willimas
Queen Mary University, London
Mile End Road
London, E1 4ns
Keir@eecs.qmul.ac.uk

Dr Tony Stockamn
Queen Mary University, London
Mile End Road
London, E1 4ns
tony.stockman@eecs.qmul.ac.uk

CHI'13, April 27 – May 2, 2013, Paris, France.
ACM 978-1-XXXX-XXXX-X/XX/XX.

Keywords
Participation; children; special needs; techno-determinism.

ACM Classification Keywords
K3.1 Computer uses in education: Collaborative learning;

Introduction

In the past decade a number of approaches have been proposed for conducting technology based design research with children with special educational needs in social and school settings. [1][3] This body of literature offers a range of approaches to engaging students in a participatory design process. Recent literature has concerned the ways in which children's ideas can be interpreted and brought into the design process [4][5]and how research methods developed for typically developing children can be adapted for use with children with special educational needs. [6] [7]

There has been less attention in the literature on the role of teachers and other support staff when conducting design research in special educational needs. There has been some work on the important role of working in partnership with teachers in mainstream schools when designing and introducing technologies [8] and some work on unintentional

interventions of staff when conducting feedback sessions on technology with children with PMLD (Profound, Complex Multiple Disabilities) [9]

A Techno-Determinist approach

Neil Selwyn argues that many of those working in the area of educational technology share an underlying belief that educational technology will in some way always be able to enhance learning and education. This, he contends, casts the role of the researcher as being one who:

…finds ways to make these technology-based improvements happen and—to coin a phrase often used in the field—to 'harness the power of technology.' [10] p. 713

This framing of the role of technology in education starts from the assumption that it has inherent attributes that, if given the correct context in which to work, will impact positively on children and their learning. This quality of the technology is seen as universal; being applicable to all children and all learning environments. It is able to act independently from human intervention and enables the equally disembodied force of 'information'.

When applying technologies to specific contexts it is the participants and setting that have to be adapted to suit the requirements of the technology in order to be able to deliver its beneficial outcomes. It can then be taken to be consistent, whatever the political, social, and economic contexts within which it is situated. This implies that once the barriers to implementing technologies, due to lack of money, resistance by teachers and other professionals, or importantly here children's impairments, the qualities of the technology will be enacted and its objectives realised.

This kind of approach closes down possibilities and stands in the way of our ability to take a critical perspective on the interactions of technologies within educational practice. When research asks the question 'how do we achieve a pre-defined outcome by using technology?', it starts from the wrong end. We do not consider that the introduction of a technology will become part of complex sets of interactions between people and place. If we realize this and are able to respond to these intersections, then not only can the outcome not be pre-defined but the problem itself will change.

Mark Prensky, an influential technology commentator and educational researcher takes a techno-determinist approach to the use of technology with children in the classroom. In his paper, "The role of technology in the classroom", Prensky discusses the role of technology in the classroom and the teacher's place in that.

The role of technology in our classrooms is to support the new teaching paradigm. [11] p.2

He contends that the role of teachers in this 'new teaching paradigm' is to guide students in how to use these new technologies and to offer some context and quality assurance but once students are able to use those technologies the students will be able to teach themselves. This seemingly student-directed model appears to be a form of democratic learning set in opposition to a authoritarian teacher-led pedagogy. This is misleading in that it simplifies the interactions between student and teacher and the multiple and

complex roles that teachers take on in the students lives.

Here the relationship between teacher and pupil is assumed to be linear. Technologies are placed at the centre of this relationship enabling research to devise and deliver technical solutions to children. This approach is based on both a determinist view of technology as possessing an innate pedagogical quality and an essentialist reading of children as sharing common traits that technology can impact upon and with. Teachers are cast as operators who deliver the solutions offered by the technology to the children.

There are far more nuanced relationships between teacher, technology, and child that needs to be understood. There are a variety of ways in which teachers, children and technologies interact within a fluctuating institutional context. The design and application of technologies for schools should start from an understanding of those interpersonal dynamics and social realities, and the limitations of any intervention within them. That is not to say that technologies cannot offer alternative practices within education but those changes will not come about through the technical qualities of a technology but through a complex realignment of people, place and institution that it may or may not play a part in.

Incorporating teachers in a participatory design process

Developing technology in SEN schools requires that we not only include children in the research and design process but that we expand our approach to include teachers and other support staff that are part of the complex interactions between staff, students and technology.

The first author of this paper has worked in a school for children with special educational needs for the past two years as part of their PhD studies. In their experiences of carrying out design research with students and staff they have developed some insights into why teachers should be included in the research process that may be useful for other researchers in the field.

Teachers choose what resources are used

Teachers choose which resources and activates are to be used with and by students. Technology should then be responsive not only to the needs of the students but also take into consideration the pragmatic requirements of teachers.

Researcher as outsider

As a researcher working in a special educational needs school we should be aware that we are working within an institution. Researchers need to develop positive relationships with staff in order to access situations that allow us to develop an understanding into the day to day working practices of teachers and the interactions that occur between themselves and students. If we blindly assume we know better than teachers and impose our ideas we are unlikely to develop meaningful and useful relationships. That is not to say that as researchers we can not offer new approaches and ideas but that we must acknowledge the value of teachers' professional practice.

Existing strategies for working with students

Teachers working in a special educational needs context will develop strategies and resources in order

to include students with a range of abilities and impairments in the learning process. If we as researchers can work with teachers to understand those strategies and resources then we can do two things.

- Make use of those strategies and resources as a means to include children in the design process by responding to their abilities and needs.

- Gain insights into the way in which the technology could be designed and adapted for students differing abilities.

Conclusions

We have discussed here reasons why we should extend our participatory approach in design research for children with special educational needs to include not only children but also the perspectives and practices of teachers. The relationship between children, technology and teachers in the learning process is complex. In order to design effective technologies that are suitable for a school context we must consider all the participants in the process. This mean expanding our focus to include not only the voices of children but also those of the teachers and support staff.

Acknowledgements

We would like to thank Threeways School, students and staff for their on going support.

References

[1] A. Druin, "The role of children in the design of new technology," *Behaviour & Information Technology*, vol. 21, pp. 1–25, 2002.

[2] T. P. Falcão and S. Price, "Informing Design for Tangible Interaction: a Case for Children with Learning Difficulties," *IDC '10: Proceedings of the 9th IDC International Conference*, p. 190, Jun. 2010.

[3] C. Frauenberger, J. Good, and A. Alcorn, "Challenges, opportunities and future perspectives in including children with disabilities in the design of interactive technology," presented at the IDC '12: Proceedings of the 11th IDC International Conference, 2012.

[4] C. Frauenberger, J. Good, W. Keay-Bright, and H. Pain, "Interpreting input from children: a designerly approach," presented at the Proceedings of the SIGCHI Conference on Human Factors in Computing Systems, New York, NY, USA, 2012, pp. 2377–2386.

[5] A. J. Hornof, "Designing with children with severe motor impairments," presented at the the 27th international conference, New York, New York, USA, 2009, pp. 2177–2180.

[6] M. L. Guha, A. Druin, and J. A. Fails, "Designing With and for Children With Special Needs: an Inclusionary Model," presented at the IDC {\textquoteright}08: Proceedings of the 7th international *IDC International Conference*, New York, NY, USA, 2008, p. 61{\textendash}64.

[7] E. Karna, J. Nuutinen, K. Pihlainen-Bednarik, and V. Vellonen, "Designing technologies with children

with special needs - Children in the centre (CiC) Framework," *IDC '10: Proceedings of the 9th IDC International Conference*, pp. 232–235, Aug. 2010.

[8] J. Robertson, A. Macvean, and K. Howland, "Embedding Technology in the Classroom: The Train the Teacher Model," *IDC International Conference*, New York, NY, USA, 2012, pp. 20–29.

[9] W. Ceri, "Unintentional intrusive participation in multimedia interactive environments," *International Journal on Disability and Human DevelopmentDisability and Human Development*, vol. 10, p. 81.

[10] N. Selwyn, "Editorial: In praise of pessimism—the need for negativity in educational technology," *British Journal of Educational Technology*, vol. 42, no. 5, pp. 713–718, 2011.

[11] M. Prensky, "The Role of Technologyin teaching and the classroom," *marcprensky.com*. [Online]. Available: http://marcprensky.com/writing/Prensky-The_Role_of_Technology-ET-11-12-08.pdf. [Accessed: 14-Aug-2012].