
Article:
Swanwick, R.A., Clarke, P. and Kitchen, R. (2014) A design-based approach for research into deaf children's reading comprehension. Hillary Place Papers, 1. pp. 1-15.

https://doi.org/10.48785/100/203

A design-based approach for research into deaf children's reading comprehension

Ruth A. Swanwick, Paula J. Clarke and Ruth Kitchen
Childhood and Inclusive Education
School of Education
University of Leeds
Leeds LS2 9JT
Email address for correspondence: r.a.swanwick@leeds.ac.uk

Acknowledgements

The authors gratefully acknowledge all the practitioners who advised on and took part in this project and the University of Leeds Pump Priming and Higher Education Innovation Funding awards.

Abstract

Design-based methodologies provide a paradigm for educational research which enables us to see beyond what is or is not working, to develop practices and interventions that 'work better' (Kelly et al., 2008, p3). This paper explains the design-based methodology and explores the use of this approach to research deaf children's reading comprehension in order to make a significant contribution to theory and impact on practice. The research context is presented and current paradigms are reviewed. The issues of researching deafness and reading in a way which takes into account the resources of the individuals and the potential of the context are illustrated and a rationale for using a design-based model is presented. The paper examines and reflects on the use of this methodology for investigating deafness and reading comprehension drawing on a current work in progress into Deafness and Reading for Meaning (DreaM) at the University of Leeds.

Introduction

Research into deafness and reading over the last 40 years has improved our understanding of aspects of deaf children's reading abilities and overall attainment issues (Harris and Marschark, 2011; Trezek et al., 2010; Marschark and Wauters, 2008). To develop this knowledge and move it forward into practice, research into deafness and reading comprehension is needed which accounts for the diversity of individual language experience as well as the range of other factors which influence the learning and acquisition of deaf children's skills in reading for meaning. This will include individual factors relating to deafness itself, learning abilities and motivation as well as the contextual influences of the school and home environments. For the purposes of this paper the term *deaf* is used to refer to any level of hearing loss (mild, moderate, severe or profound) which significantly effects a child's language and literacy development.

In a design-based approach the act of design itself is part of the inquiry which tends to be solution-focused and ultimately concerned with improving learning (Reimann, 2011; Bannan-Ritland and Baek, 2008; Kelly et al., 2008; Barab and Squire, 2004; Cobb et al., 2003; Baumgartner and Bell, 2002; Brown, 1992; Collins, 1992). This methodology is concerned with the dual processes of contributing to theory whilst also contributing to educational practice through active engagement with the environment, which includes the policies; curriculum; people and ethos (Cobb et al., 2009; Sandoval and Bell, 2004; Edelson, 2002). It is an approach which prioritises a focus on research outputs which are contextually relevant and properly shared or communicated and, as such, a methodology which embraces and anticipates the 'rich, complex, and constantly changing environment of the classroom' (Brown, 1992, p.144).

The research context

Becoming a successful reader presents one of the most significant barriers to learning and achievement for deaf young people throughout their school career and beyond into employment (Trezez et. al., 2010; Luckner et al., 2006). The majority of deaf students leave school (at 18 years of age) with a mean reading age of 9 years (Traxler, 2000; Powers et al., 1998; Conrad, 1979), and despite extensive and dedicated research attention to this area of deaf education the levels of attainment are hardly improving (Harris and Terlektsi, 2011; Hendar, 2009; Marschark et al., 2010; 2007; Wauters et al., 2006). Research in this area to date reveals a wealth of information about certain aspects of deaf children's reading abilities and attainment, but leaves many unanswered questions about what leads to successful reading comprehension for deaf children (Mayberry et al., 2011; Wang and Paul, 2011; Wauters et al., 2008). We are still far from understanding the full extent of the challenges that reading for meaning poses for deaf children or indeed how deaf children's reading comprehension skills can be effectively taught and reliably measured

(Easterbrookes, 2010; Spencer and Marschark, 2010; Trezek et al., 2010; Marschark et al., 2009; Luckner et.al., 2006).

This uncertainty can be explained in part by the theoretical perspectives and methodological approaches which have prevailed in this field. Research has tended to focus on isolated literacy variables (Wang and Paul 2011, p.56) rather than consider the full range of processes necessary for successful reading comprehension (Perfetti et al., 2005; Schirmer and McGough, 2005; Kintsch and Rawson, 2005; Gough and Tunmer, 1986). These, according to the 'Simple model', can broadly be described as decoding and language comprehension skills (Gough and Tunmer, 1986). More precisely, the 'Construction Integration model' (Kintsch and Rawson, 2005) highlights the role of readers' prior knowledge in understanding text and emphasises inferencing ability as central to reading comprehension success. With regards research into deafness and reading, certain text-based aspects of the reading process, such as phonological coding and word recognition skills have been emphasised but less attention has been given to reader, task and context variables (Wang and Paul, 2011; Marschark et al., 2009; Marschark and Wauters, 2008). This fragmentation has made it difficult to translate research into 'usable, actionable and adoptable' outcomes for practice and intervention (Bannan-Ritland, 2003, p.24).

A challenging issue for both theory and practice in the field of deafness and reading is the heterogeneous nature of the deaf school population and the diversity of factors influencing reading success. One set of variables to be considered is the nature and level of individual hearing loss and the subsequent impact on a child's communication, learning and social development (Moeller et al., 2007; Goldberg and Richburg, 2004). A second issue is the diverse early language experiences that deaf children encounter depending on whether they have deaf or hearing family members and other home languages (Geeslin, 2008; Swanwick and Watson, 2007; Kaderavek and Palulski, 2007). Added to this, it is estimated 40% of deaf children present additional and complex needs which influence behavioural, cognitive, social, motor and sensory skills and processes (Connix and Moore, 1997). Deaf young people also bring varied language resources to the task of reading such as limited access to speech sounds and experience of another language modality (sign language). This complicates how we collect, analyse and interpret research findings, but offers opportunities to explore original approaches to research for this and other diverse populations.

Research in deafness and reading comprehension has tended to isolate and control variables (such as levels of hearing loss, educational placement, language histories) and focus on sub- groups of deaf children and sub-skills of reading. This means that the research has not always considered the complexities of the reading process and the diversity of the population. For example, many deaf children bring skills in sign language and other spoken languages to the task of reading for meaning (Menendez, 2010; Plaza-Pust and Morales-López, 2008; Niederberger, 2008; Swanwick and Watson, 2007). This multilingual and multimodal dimension brings additional complexities relating to the relationship between

sign language and literacy that have to be considered for deaf children's reading difficulties to be properly understood. We refer here to the challenges posed by the *unmappability* between British Sign Language (BSL) and English because of the different modalities: sign, spoken and written language (Mayer and Wells, 1996). In order to capture and analyse diverse routes to reading success as well as the atypical resources that deaf individuals bring to the task, a methodology is needed which characterises and describes these variables (Freel et al., 2011).

A further characteristic of existing research into deafness and reading is that it has not thus far directly involved the agents who can make a difference in the educational context or that have a strong personal stake in the research. Agents in this context include the practitioners, parents, and the young deaf people themselves, sometimes referred to as 'stakeholders' in the design-based discourse (Reimann, 2011). Practitioners tend to be viewed as end-users of projects and often find that research findings are inaccessible or do not articulate with their practical issues. There is a need for more effective partnerships between researchers and teachers in deaf education and for research outcomes to be effectively applied to the classroom (Spencer and Marschark, 2010; Swanwick and Marschark, 2010).

Projects which involve parents as expert partners are scarce (e.g. Dalzell et al., 2007; DesGeorges, 2003). Deaf children and their parents are more usually constructed as research subjects and are rarely involved in the identification of research questions or design (e.g. DesJardin et al., 2009; Plessow-Wolfson and Epstein, 2005). This appears contradictory since the establishment of close involvement and 'sustainable relationships' between researchers and stakeholders (Nieveen et al., 2006, p.238) would seem to be a highly appropriate objective for research into reading and deafness given that deaf children's experience of reading is largely contingent on the understandings and actions of the adults in the home, (Aram et al., 2008; Stobbart and Alant, 2008) and school environments (Knoors and Hermans, 2010).

The DReaM project

The Deafness and Reading for Meaning (DReaM) project at the University of Leeds adopts a design-based approach to investigating deaf children's reading for meaning, taking inspiration from the influential papers by Ann Brown (1992) and Allan Collins (1992), and the ensuing discussions in the special issues of Journal of the Learning Sciences, 13 (1); Education Researcher, 32 (1) and Educational Psychologist, 39 (4); and edited text books (Barab and Squire, 2004; Edelson, 2002; Kelly, 2003; Reimann, 2011; Walker, 2011). This approach lends itself to seeking new theoretical frameworks which are not reliant on existing models. This is pertinent for the research context and issues described as this methodology allows room to seek solutions to teaching and assessment problems as they

emerge (Barab and Kirshner, 2001) by generating and cultivating rather than confirming hypotheses (Kelly, 2006; Brown, 1992). This enables us to avoid entrenched views of what reading comprehension involves and 'look beyond the obvious' to identify what the real comprehension issues are for deaf learners (Marschark et al., 2009, p. 58).

The DReaM project is concerned with developing appropriate reading assessment tools and intervention strategies for deaf young people. As such, this project seeks to bridge the research-practice gap through the development of intervention and assessment materials or approaches which can be adopted and enacted within the context of the research. The outputs of this research will be tangible tools and materials, as well as assessment and intervention processes which are migratable across contexts (Middleton et al., 2008). In design-based discourse, these outputs are referred to as 'artefacts' (Larson and Dearing, 2008; Brown, 1992). The project has three phases and is now in its third phase.

DReaM 1: Practitioner voices

The first phase of the project was designed to engage practitioners in research into deafness and reading comprehension from the start and to ensure that we 'knew' our research context. We wanted to find out the issues in supporting deaf children's reading development as experienced by deaf and hearing practitioners; their understandings of reading comprehension processes and their particular professional perspectives. We also wanted to extend our knowledge of deaf children's reading experiences and comprehension taking into account their diverse multilingual and bimodal language experience and backgrounds. This starting point involved a full deaf education support team comprising teachers of the deaf, communication support workers and deaf adults from a UK citywide service covering early years, primary and secondary settings. Using a focus group methodology practitioners were asked to consider what reading comprehension involves for deaf learners and identify factors that influence success. Analysis of the focus group *talk* about deaf children's reading comprehension revealed commonalities and differences across different practitioner 'voices' which shape different understandings of the reading comprehension issues. Using teacher interviews we also developed a series of mini case studies of individual deaf children's language and reading experience. The findings (reported in full in Swanwick et al., 2012) provoke discussion of research, assessment and intervention approaches which better exploit the research-practice interface by incorporating the diverse perspectives that practitioners and other agents bring to the process.

DReaM 2: Action research networks

As a result of DReaM 1, many of our practitioner colleagues began to question, challenge and develop their own reading comprehension work with deaf children to engage with

specific research questions within their working context. In response to their request for support we set up some national workshops to explore the use of an action research model that practitioners could use in their own settings to investigate their own questions. This began as a small group of schools and services and some of the early projects are reported in the BATOD Magazine (2012, pp. 40-41) and on the DReaM website www.thereadingrhizome.com. Since then national interest in this way of working has grown and more schools, services and individuals are designing and implementing their own action research projects. The unique feature of this work is that it is practitioner-led and our role as researchers is to sustain the momentum of the activities and lightly hold the shape of the projects. We support individual settings with this work and have also hosted three Action Research Symposiums, which have included participation from European and USA partners. This way of working with practitioners has developed genuine and productive research-practice partnerships and has opened up dialogue both nationally and internationally about new ways of envisioning the interface between research and practice in deaf education.

DReaM 3: Assessment and intervention design

Phase 3 is on-going and takes the DReaM work forwards into the development of a design process for a framework for reading comprehension intervention. This responds directly to the concerns of the deaf education practitioners in our developing research network. The research problem at the centre of this phase of the project is how to design a reading comprehension intervention artefact which builds on established home and school practices and expertise; contributes to theory development and improves learning. The work done so far illustrates that practitioners and parents are already tackling many of the issues associated with deaf children's poor comprehension skills with a good understanding of the complexities and realities of the research context, but that they are not addressing the full range of comprehension skills. This is not surprising given that our review of the international literature found no existing evidenced-based intervention programmes that cover the full range of comprehension skills and processes. Against this background we seek to develop a method for developing a reading intervention artefact which is informed by and elaborated from established expertise and practices at home and school, and is:

- Robust: mapped onto to the comprehension competencies
- Relevant: sensitised to the schools and services population
- Flexible: able to be matched to individual pupil profiles
- Ecological: includes the range of experiences and adult roles at home and at school, and changing learning contexts throughout development.

We have a adopted a collaborative methodology for this phase of the project so that we can effectively trial a process for developing a whole school approach to reading comprehension intervention. This entails establishment of a research partnership through the secondment of two practitioner-researchers (PRs) from two deaf education settings (one school for the deaf and one inclusive service) to work with the two university investigators (UIs). The steps through the project are designed to exploit and combine the different skills, expertise and perspectives that researchers and practitioners bring to the problem (see Fig. 1).

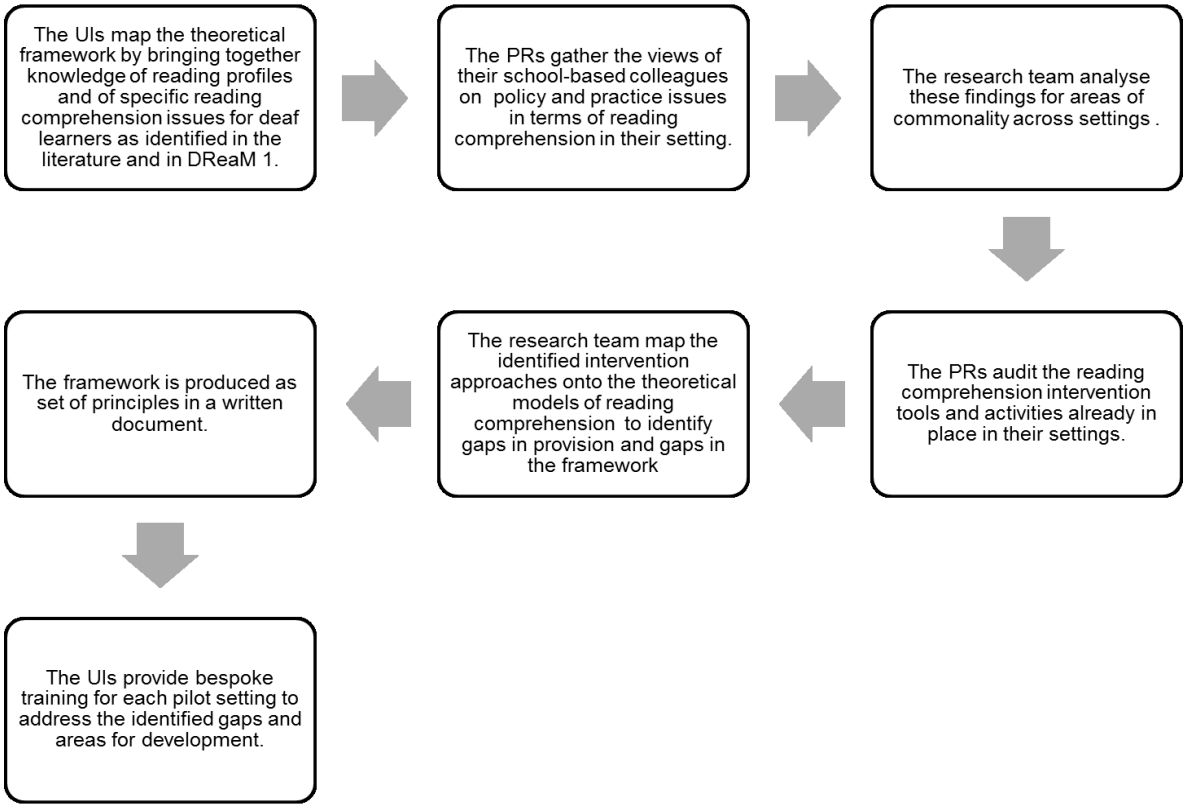

Fig. 1: The steps through the intervention design process

Integral to this project is an evaluation of the process of developing an intervention that is fit for purpose (i.e. valid for the context), but which also has sufficient rigour. This evaluation will particularly focus on the transaction between theory and practice to develop intervention approaches. As part of the evaluation we will be revisiting and revising the theoretical framework. We will also systematically collect and record the developments and activities involved in the process, from research and practice perspectives. This is a self-critical and reflective aspect of the project, characteristic of design based methodologies.

Discussion

The final section of this paper provides a synthesis of what has been learnt from the DReaM project so far considering the design-based methodological principles of theory development, project design, the development of artefacts and research impact.

Contribution to theory

The theoretical basis of the DReaM study is informed by current understandings of deaf children's reading experience and achievement and pertains to methodological approaches to reading research with this population. These are synthesised with the research context to challenge conventional approaches and perspectives to expose different ways of looking at deafness and reading. This paradigm shift is the major contribution to theory achieved by the DReaM project. It is born out of dialectic between empirical, contextual knowledge and perspectives from theory.

Design knowledge

The DReaM project design draws on two types of knowledge: theories about the reading and assessment process from research and the personal and professional experience of the stakeholders involved. The cycle of trial and evaluation built into the design provides the opportunity for prospection (forward) but also necessitates reflection (backward) as responses to the tools and materials are repeatedly tested (Dede, 2004). The research environment thus becomes in itself an ecology of learning. This term reflects the intrinsic interaction and influence of agents, contexts and constraints (Cobb et al., 2003). The research terrain is multilayered and shifts over time as policies, practices, technologies and agents change and evolve.

Development of artifacts

In the DReaM study practitioners, parents and young deaf people are involved in developing artefacts i.e. tools and approaches in reading assessment and intervention. This is achieved through an action research cycle of innovation, trial and review. This empowers practitioners to develop reflective approaches to implementing novel interventions. This simultaneously creates an ongoing cycle of evidence and new questions about reading comprehension and deafness.

Impact

The DReaM project brings research closer to practice. Impact is thus realised at grass roots (home and school) and at policy level. This is enacted through engaging agents with the research questions and consulting them regarding the planned methodology. The wider outcomes of the research entail the development of an educational culture which encourages individuals to become critical and gain agency over their development. Phase one of the project established professional networks and a fledgling research community through the project website, seminars and workshops and action research centres www.thereadingrhizome.com.

Conclusion

Whilst design-based approaches strive for 'novelty and usefulness' (Edelson, 2002, p.118) they are not atheoretical. They are driven by, and test, theory with the goal of generating new theories or ways of looking which are contextually valid. This approach to developing warrantable knowledge is ideally suited to the development and evaluation of innovations within an educational environment where there is willingness to work towards improvement, and a commitment to collaboration and change (Stoker and John, 2009). Although design-based methods have been in development since the 1970s, this approach offers a new way to bring theoretical questions into the domain of practice in deaf education. It is an approach which is responsive to the population concerned and delivers outputs quickly into the hands of practitioners and policy makers, and as such provides a means of achieving a warranted contribution to theory and an impact on educational practice.

References

Aram, D. et al. 2008. Early literacy of kindergartners with hearing impairment: The role of mother-child collaborative writing. *Topics in Early Childhood Special Education,* **28** *(*1), pp.31-41.

Barab, S. A. and Kirshner, D. 2001. Methodologies for capturing learner practices occurring as part of dynamic learning environments. *The Journal of The Learning Sciences,* **10** (1&2), pp.5-15.

Barab, S. and Squire, K. 2004. Design-Based Research: Putting a Stake in the Ground. *The Journal of the Learning Sciences,* **13** (1), pp.1-14.

Bannan-Ritland, B. 2003. The Role of Design in Research: The Integrative Learning Design Framework. *Educational Researcher,* **32** (1), pp.21-24.

Bannan-Ritland, B. and Baek, J.Y. 2008. Investigating the act of design in design-based research: The road taken. In: Kelly, A. E., Lesh, R. A and Baek, J. Y. eds.

Handbook of Research Methods in Education. New York: Routledge, pp. 299 - 320

Baumgartner, E. and Bell, P. 2002. Design-based research: An emerging paradigm for educational inquiry. *Educational Researcher,* **32** (1), pp.5-8.

Brown, A. L. 1992. Design Experiments: Theoretical and Methodological Challenges in Creating Complex Interventions in Classroom Settings. *The Journal of the Learning Sciences, **2*** (2), pp.141-178.

Cobb, P. et al. 2003. Design Experiments in Educational Research. *Educational Researcher,* **32** (1), pp.9-13.

Cobb, P.et al. 2009. Conducting design experiments to support teachers'learning: A reflection from the field. The *Journal of the Learning Sciences,* **18** (2), pp.165-199.

Collins, A. 1992. Towards a design science of education. In: Scanlon E and T. O'Shea. T. eds. *New directions in educational technology*. Berlin: Germany: Springer, pp. 15 – 22

Collins, A. et al. 2004. Design Research: Theoretical and Methodological Issues. *The Journal of the Learning Sciences,* **13** (1), pp.15-42.

Connix, F. and Moore J.M. 1997.The multiply handicapped deaf child. In: McCracken, W. and. Laiode-Kemp, S. eds. *Audiology in Education*. London: Whurr. pp.107 – 135.

Conrad, R. 1979. *The deaf school child: Language and cognitive function*. London: Harper& Row.

Dalzell, J. et al. 2007. Involving families who have deaf children using a Family Need

Survey: a multi-agency perspective. *Child: Care, Health and Development,* **33**(5), pp.576-585.

Dede, C. 2004. If Design-Based Research Is the Answer, What Is the Question? A Commentary on Collins, Joseph, and Bielaczyc; diSessa and Cobb; And Fishman, Marx, Blumenthal, Krajcik, and Soloway JLS Special Issue on Design-Based Research. *The Journal of the Learning Sciences,* **13**(1), pp.105-114.

DesGeorges, J. 2003. Family perceptions of early hearing, detection, and intervention systems: Listening to and learning from families. *Mental Retardation and Developmental Disabilities Research Reviews,* **9** (2), pp.89-93.

DesJardin, J. L. et al. 2009. Literacy Skills in Children With Cochlear Implants: The Importance of Early Oral Language and Joint Storybook Reading. *Journal of Deaf Studies and Deaf Education,* **14** (1), pp.22-43.

Easterbrooks, S.R. 2010. Evidence-based curricula and practices that support development of reading skills. In: Marschark, M. and Spencer. P.E. *The Oxford handbook of deaf studies, language, and education. Volume 2*. New York: OUP, pp. 111 – 126

Edelson, D. C. 2002. Design Research: What We Learn When We Engage in Design. *The Journal of the Learning Sciences,* **11**(1), pp.105-121.

Freel, B. L. et al. 2011. Deaf individuals' bilingual abilities: American Sign Language

proficiency, reading skills, and family characteristics. *American Annals of the Deaf*, ***2*****(**1), pp.18-23.

Geeslin, J. D. 2008. Deaf bilingual education: A comparison of the academic performance of deaf children of deaf parents and deaf children of hearing parents. *Dissertation Abstracts International Section A: Humanities and Social Sciences* **68**(11–A), p.4582.

Goldberg, L. R.and Richburg, C. M. 2004. Minimal hearing impairment: Major myths with

more than minimal implications. *Communication Disorders Quarterly* **25,** pp.152-160.

Gough, P.B. and Tunmer, W.E. 1986. Decoding, Reading, and Reading Disability *Remedialand Special Education* **7**(1), pp.6-10

Hall, B. 2001. I wish this were a poem of practices of participatory research. In Reason, P.

and Bradbury, H. *Handbook of action research*. London: SAGE, pp. 171-178.

Harris, M. and Marschark, M. 2011. Literacy in the Classroom and Beyond. *Journal of Deaf Studies and Deaf Education,* **16** (1), p.1.

Harris, M. and Terlektsi, E. 2011. Reading and Spelling Abilities of Deaf Adolescents With Cochlear Implants and Hearing Aids. *Journal of Deaf Studies and Deaf Education,* **16** (1), pp.24-34.

Hendar, O. 2009. *Goal fulfilment in schools for the deaf and hearing-impaired*. The National Agency for Special Needs Education and Schools, Sweden.

Kaderavek, J. and Pakulski, L. 2007. Mother-child story book interactions: Literacy orientation of pre-schoolers with hearing impairment. *Journal of Early Childhood Literacy,* **7**(1), pp.49-72.

Kelly, A. E. 2003. Theme issue: The role of design in educational research. *Educational Researcher,* **32**(1), pp.3–4.

Kelly, A. 2004. Design research in education: yes but is it methodological? *The Journal of the Learning Sciences*, **13**(1), pp.115-128.

Kelly, A. 2006. Quality criteria for design research: evidence and commitments. In: van den

Akker, J., Gravemeijer, K., McKenny, S. and Nieveen N. eds. *Educational design research* New York: Routledge, pp. 166 -184.

Kelly, A. E. et al. 2008. Enabling Innovations in Education and Systemizing their Impact. In

Kelly, A.E., Lesh, R.A. and Baek, J.Y. eds. *Handbook of Design Research Methods in Education* New York:Routledge, pp. 3-18.

Kintsch, W. and Rawson, K.A. 2005. Comprehension. In: Snowling M.J and Hulme, C. eds.

The Science of Reading: A Handbook. Oxford, Blackwell Publishing.

Knoors, H. and Hermans, D. 2010. Effective Instruction for Deaf and Hard-of-Hearing

Students: Teaching Strategies, School Settings, and Student Characteristics. In: Marschark, M. and P.E. Spencer.P.E eds.*The Oxford handbook of deaf studies, language, and education. Volume 2*. New York: OUP, pp. 57 – 71.

Larson, R.S., and Dearing, J.W. 2008. Design research and the diffusion of innovation. In:

Kelly, A.E., Lesh, R.A. and Baek, J.Y. eds. *Handbook of Design Research Methods in Education* New York: Routledge, pp. 511 – 534

Luckner, J. L. et al. 2008. A summary of the reading comprehension research undertaken

with students who are deaf or hard of hearing. *American Annals of the Deaf,* **153** (1), pp.6-36.

Luckner, J. L. et al. 2006. An Examination of the Evidence-Based Literacy Research in Deaf

Education. *American Annals of theDeaf* **150,** pp.443-456.

Marschark, M. et al. 2007. Effects of Cochlear Implants on Children's Reading and

Academic Achievement. *Journal of Deaf Studies and Deaf Education.***12** (3), pp.269-282.

Marschark, M. et al. 2010. Will cochlear implants close the reading achievement gap? In:

Marschark, M. and Spencer. P.E. eds. *The Oxford handbook of deaf studies, language, and education. Volume 2*.New York: OUP, pp. 127-143.

Marschark, M. et al. 2009. Are deaf students' reading challenges really about reading?

American Annals of the Deaf **154**, pp.357-370.

Marschark, M. and Wauters, L. 2008. Language comprehension and learning by deaf students. In Marschark, M. and Hauser, P. eds, *Deaf cognition: Foundations and outcomes*. New York: OUP, pp. 309-350

Mayberry, R. I. et al. 2011. Reading Achievement in Relation to Phonological Coding and

Awareness in Deaf Readers: A Meta-analysis. *Journal of Deaf Studies and Deaf Education, 16 (*2), pp.164-188.

Mayer, C. and Wells, G. 1996. Can the Linguistic Interdependence Theory Support a Bilingual-Bicultural Model of Literacy Education for Deaf Students? *Journal of Deaf Studies and Deaf Education* **1**(2): pp.93-107.

Menendez, B. 2010.Cross-modal bilingualism: language contact as evidence of linguistic transfer in sign bilingual education. *International Journal of Bilingual Education and Bilingualism* **13***,* pp.201-224.

Middleton, J. et al. 2008. The 'compleat' design experiment: from soup to nuts. In: Kelly,

A.E., Lesh, A. and Baek, J.Y. eds. *Handbook of Design Research Methods in Education.* New York: Routledge. pp. 21 – 46.

Moeller, M. P. et al. 2007. Current state of knowledge: Language and literacy of children

with hearing impairment. *Ear& Hearing* **28**, pp*.*740-753.

Niederberger, N. 2008. *Does the knowledge of a natural sign language facilitate dea children's learn to read and write? Insights from French Sign Language and written French data.* In: Plaza-Pust, C and Morales-López, E. eds. Sign Bilingualism:

Language development, interaction, and maintenance in sign language contact situations. Amsterdam: John Benjamins Publishing Company, pp.29-50

Plessow-Wolfson, S. and Epstein, F. 2005. The Experience of Story Reading: Deaf Children and Hearing Mothers' Interactions at Story Time. *American Annals of the Deaf,* **150**(4), pp.369-378.

Perfetti, C.A. et al. 2005. The Acquisition of Reading Comprehension Skill. In M.J. Snowling, M.J. and C. Hulme eds. *The Science of Reading: A Handbook*. Oxford, Blackwell Publishing.

Plaza Pust, C, and Morales-López, E, 2008. *Sign bilingualism: language development, interaction, and maintenance in sign language contact situations*. Studies in bilingualism, v. 38. Amsterdam: John Benjamins.

Powers, S. et al.1998. *The Educational achievements of deaf children: A literature review*.

Research report, RR 65. London: H.M.S.O.

Reimann, P. 2011. Deign based research. In: Markauskaite, L., Freebody, P. and Irwin,J. eds. *Methodological choice and design: Scholarship, policy and practice in social and educational research*. Germany: Springer, pp.37-50.

Sandoval, W.A.and Bell, P. 2004. Design-based Research Methods for Studying Learning in Context. *Educational Psychologist* **39**(4), pp.199 – 201.

Schirmer, B. R .and McGough, S. M. 2005. Teaching Reading to Children Who Are Deaf: Do the Conclusions of the National Reading Panel Apply? *Review of Educational Research,* **75**(1), pp.83 – 117.

Snowling, M. J. and Hulme, C. 2011. Evidence-based interventions for reading and language difficulties: Creating a virtuous circle. *British Journal of Educational Psychology,* **81**, (1), pp.1-23.

Spencer, P.E. and Marschark, M. 2010. *Evidence-based practice in educating deaf and hard of-hearing students.* New York: Oxford University Press.

Stobbart, C. and Alant, E. 2008. Home-Based literacy experiences of severely to profoundly deaf preschoolers and their hearing parents. *Journal of Developmental and Physical Disabilites,* **20** (2), pp.139-153.

Stoker, G. and John, P. 2009. Design Experiments: Engaging Policy Makers in the Search for Evidence about What Works. *Political Studies,* **57** *(*2), pp.356-37

Swanwick, R. A. et al.2012 Practitioner Talk on Deaf Children's Reading Comprehension:

Analysing Multiple Voices. *Deafness and Education International* **14** (2), pp.100 – 120

Swanwick, R. 2011. The DReaM Project. *British Association of Teachers of the Deaf Magazine*, March edition, pp. 14 – 15.

Swanwick, R. and Marschark, M. 2010. Enhancing education for deaf children: Research into practice and back again *Deafness and Education International* **12**(4), pp.217–235.

Swanwick, R. and L. Watson. 2007. Parents Sharing Books With Young Deaf Children in Spoken English and in BSL: The Common and Diverse Features of Different Language Settings. *Journal of Deaf studies and Deaf Education* **12(**3), pp.385-405.

Traxler, C. B. 2000. The Stanford Achievement Test, 9th Edition: National norming and performance standards for deaf and hard-of-hearing students. *Journal of Deaf Studies and Deaf Education* **5**(4), pp.337-48.

Trezek, B. J. et al. 2010. *Reading and deafness: Theory, research, and practice*. Clifton Park, NY: Delmar/Cengage Learning.

Walker, R. 2011. Design-based research: Reflections on some epistemological issues and practices. In: Markauskaite, L. Freebody, P.and Irwin, J. eds. *Methodological choice and design: Scholarship, policy and practice in social and educational research*. Germany: Springer, pp. 51 – 56.

Wang, Y. and Paul, P. 2011. Integrating technology and reading instruction with children who are deaf or hard of hearing: The effectiveness of the cornerstones project. *American Annals of the Deaf,* **156** (1), pp.56 – 68.

Wauters, L., van Bon, W., and Tellings, A. 2006. Reading Comprehension of Dutch Deaf Children. *Reading and Writing,* **19**(1), pp.49-76.

Wauters, L. et al. 2008. Mode of Acquisition as a Factor in Deaf Children's Reading Comprehension. *Journal of Deaf Studies and Deaf Education,* **13**(1), pp.21-38.