



University of HUDDERSFIELD

University of Huddersfield Repository

McDowell, James

Design-based research as a methodological approach to support participatory engagement of learners in the development of learning technologies

Original Citation

McDowell, James (2015) Design-based research as a methodological approach to support participatory engagement of learners in the development of learning technologies. In: ALT Annual Conference 2015 Shaping the Future of Learning Together, 8th - 10th September 2015, University of Manchester.

This version is available at <http://eprints.hud.ac.uk/25762/>

The University Repository is a digital collection of the research output of the University, available on Open Access. Copyright and Moral Rights for the items on this site are retained by the individual author and/or other copyright owners. Users may access full items free of charge; copies of full text items generally can be reproduced, displayed or performed and given to third parties in any format or medium for personal research or study, educational or not-for-profit purposes without prior permission or charge, provided:

- The authors, title and full bibliographic details is credited in any copy;
- A hyperlink and/or URL is included for the original metadata page; and
- The content is not changed in any way.

For more information, including our policy and submission procedure, please contact the Repository Team at: E.mailbox@hud.ac.uk.

<http://eprints.hud.ac.uk/>



University of
HUDDERSFIELD

Design-based research as a methodological approach to support participatory engagement of learners in the development of learning technologies

Dr James McDowell

University of Huddersfield

What is Design-Based Research?

History and Nature of Design-Based Research (DBR)

Originated by Ann Brown (1992) and Alan Collins (1992) to enable research to be conducted in the 'messy conditions' of authentic educational settings

Interdependence of theory and practice is key to design-based research (e.g. Brown, 1992; Collins, 1992; DBRC, 2003)

Offers opportunities to conduct mixed methods research which is flexible and responsive to the data, allowing for an emergent research design

Can incorporate other methodologies (e.g. case study) within an overarching methodological approach

Motivations for the Research

Teaching in a highly visual area within the Computing discipline (games) ...

Previous study had highlighted opportunities to introduce video tutorials

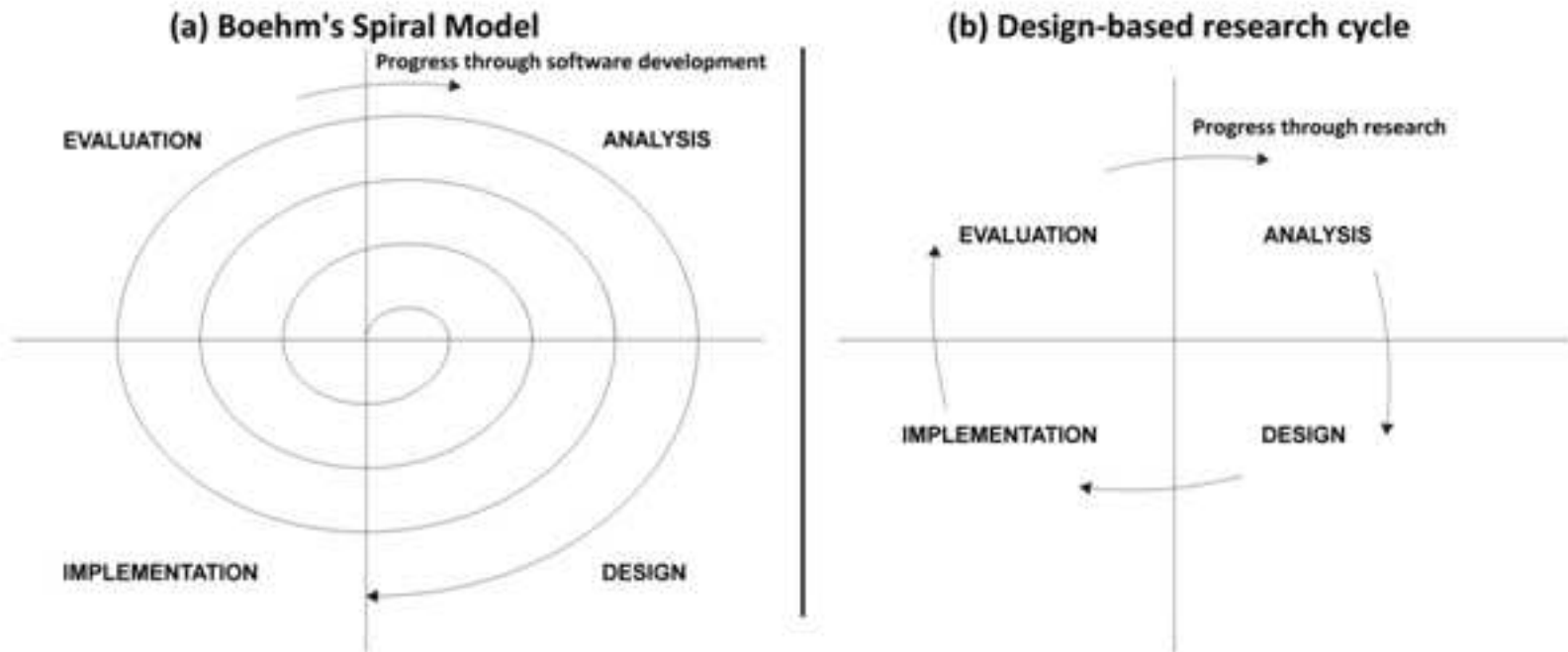
High incidence of SpLDs including dyslexia, autistic spectrum conditions

Aiming to promote greater inclusivity/level the playing the field

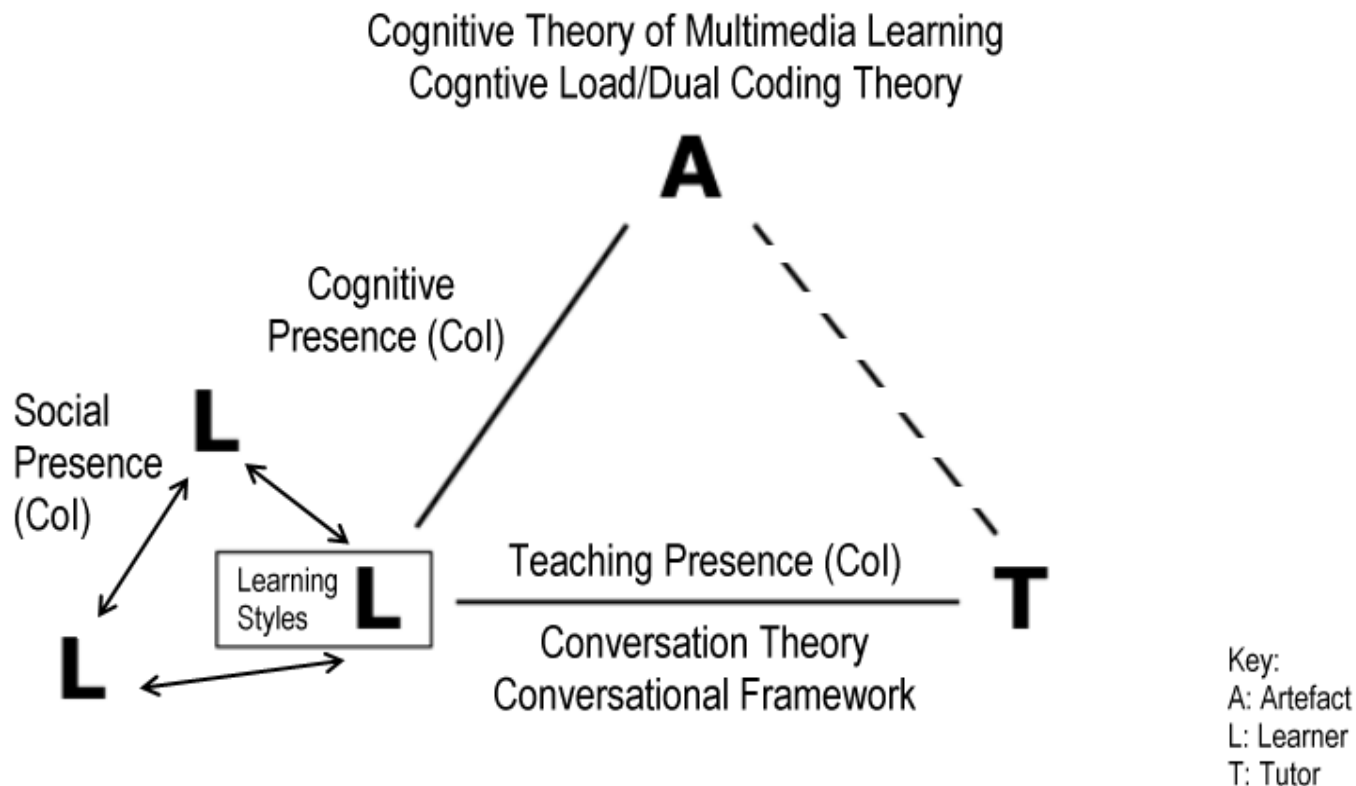
Desire to engage students with assessment *for* learning

Need to provide timely, usable, and effective feedback

DBR Cycles and Software Engineering Models

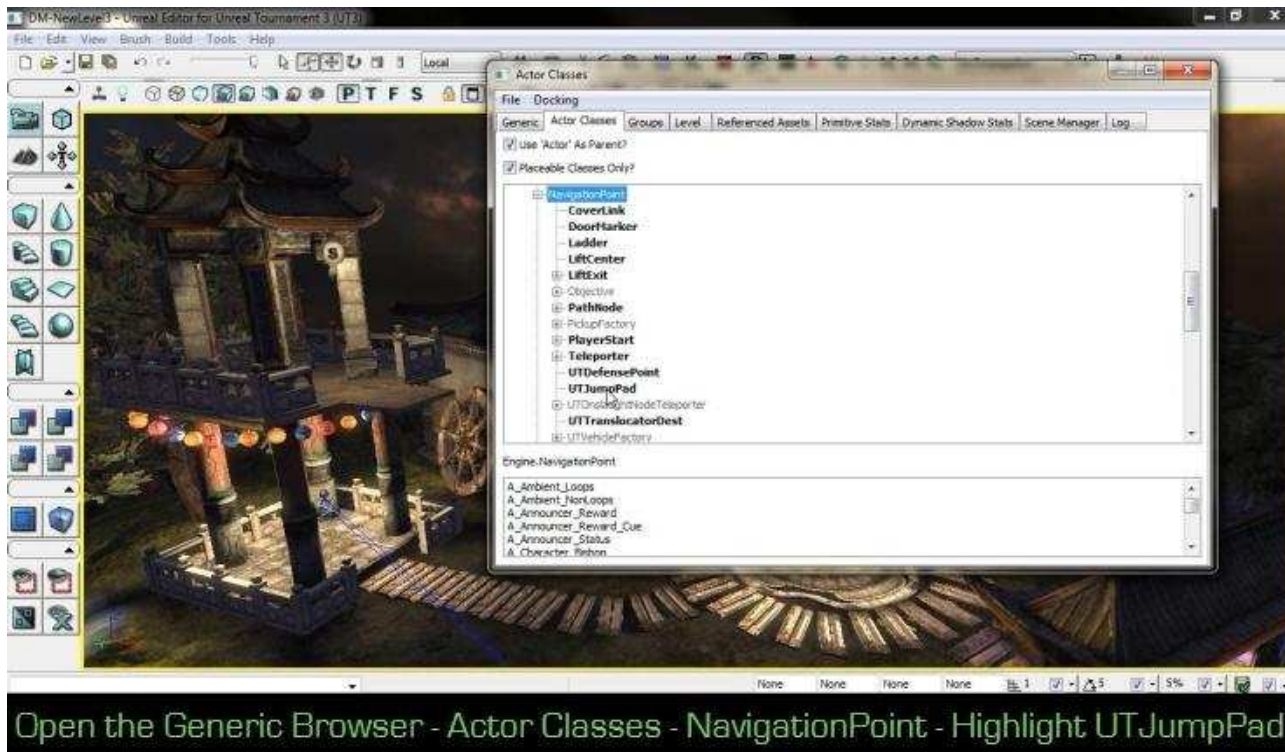


Theoretical Backdrop



Three Research Cycles: First Cycle

Introduction of Instructional Tutorial Videos (ITVs)

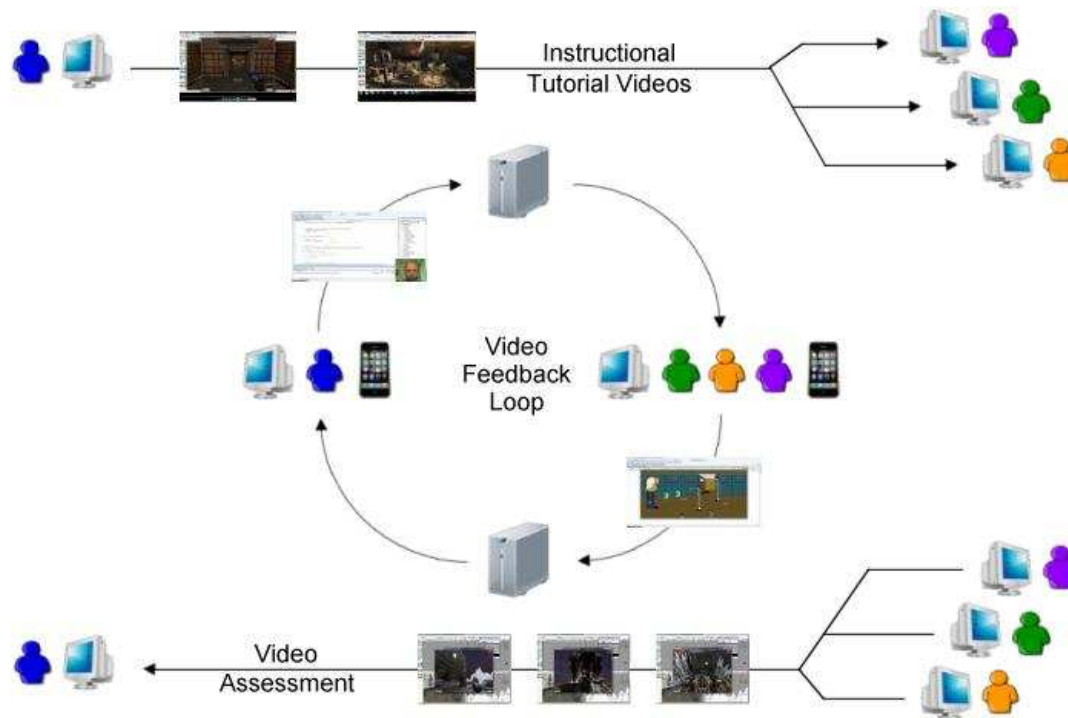


Inspiring tomorrow's professionals

Findings: Feed-forward, Dialogue, Visual Demos
Refinements: Video-Enhanced Assessment/Feedback

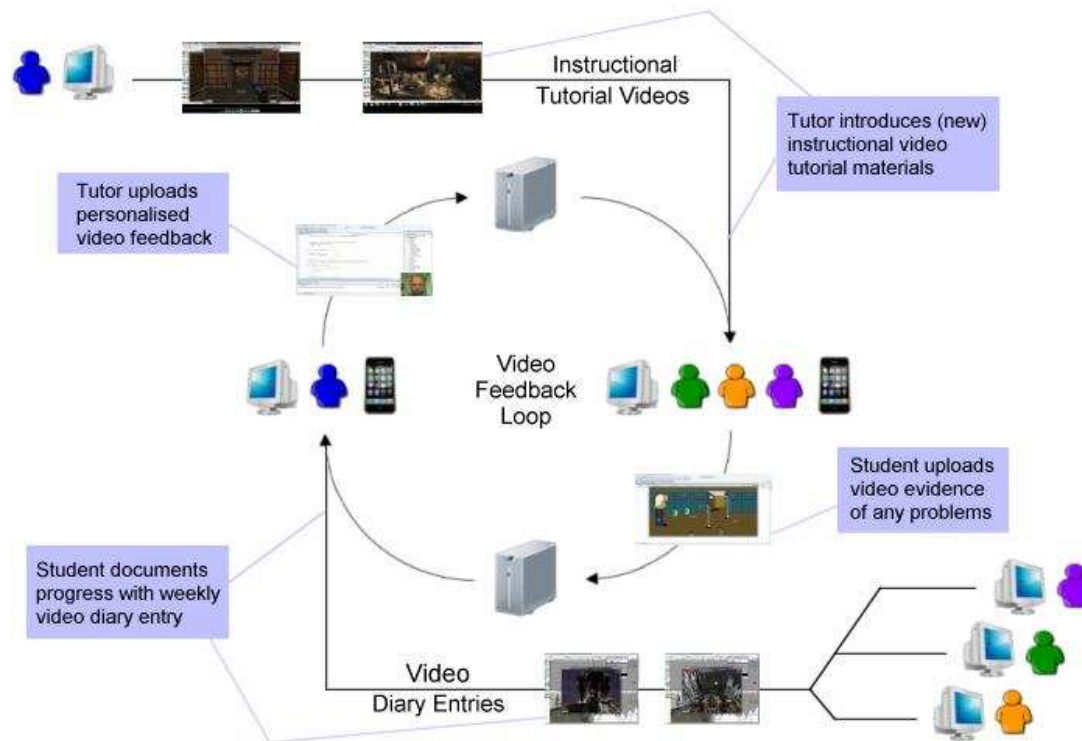
Three Research Cycles: Second Cycle

Design, Implementation and Evaluation of VEA/VEF Techniques

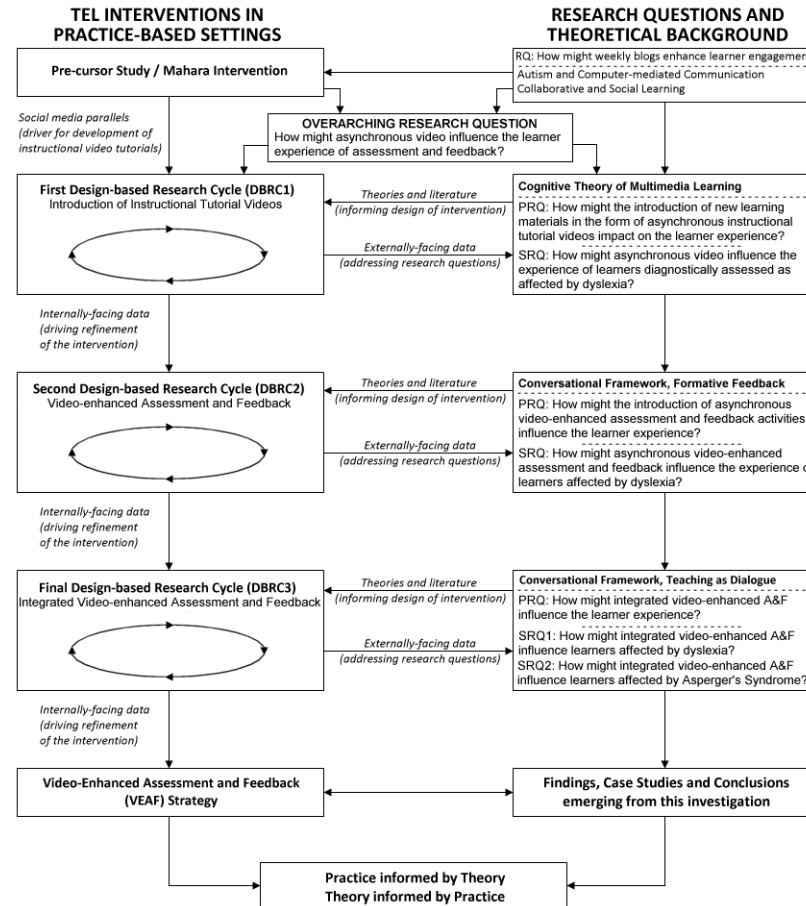


Three Research Cycles: Third Cycle

Refinement of Techniques to Form Integrated Model



Data Collection and Analysis



Phase Differences in DBR

Design and implementation phases clearly differentiated during Cycle 1, where focus was on development of *artefacts* (i.e. ITVs)

Differentiation began to blur in Cycle 2 when developing *techniques* (e.g. video-feedback loop), where design and implementation phases became less distinct

In Cycle 3, differentiation between analysis and design phases became blurred, where techniques were refined to form an integrated *system*

Flexibility a Key Advantage of DBR

DBR can bridge the paradigmatic divide, knitting together elements of both cognitive and social theories of learning

Student participation in the development of learning technologies can lead to the enhancement of inclusivity, reflexivity, autonomy and academic performance

“Where participants play an active role in defining and shaping an intervention, the application of the personalisation effect (Mayer, Fennell, Farmer & Campbell, 2004), within a dialogic interviewing framework underpinned by a collapsed tutor-student hierarchy, offers a strong vehicle through which to engage with participants as students in the role of practitioner, and to engage students as participants in the role of researcher.”



University of
HUDDERSFIELD

Any Questions?

Inspiring tomorrow's professionals

References

- Brown, A. L. (1992). Design Experiments: Theoretical and Methodological Challenges Creating Complex Interventions in Classroom Settings. *The Journal of the Learning Sciences*, 2(2), 141-178.
- Chandler, P., & Sweller, J. (1991). Cognitive load theory and the format of instruction. *Cognition and instruction*, 8(4), 293-332.
- Collins, A. (1992). Towards a design science of education. In E. Scanlon & T. O'Shea (Eds.), *New directions in educational technology* (pp. 15-22). Berlin: Springer.
- Design Based Research Collective. (2003). Design based research: An emerging paradigm in educational inquiry. *Educational Researcher*, 32(1), 5-8.
- Garrison, D. R., Anderson, T., & Archer, W. (1999). Critical inquiry in a text-based environment: Computer conferencing in higher education. *The Internet and Higher Education*, 2(2), 87-105.
- Knight, P., & Saunders, M. (1999). Understanding teachers' professional cultures through interview: a constructivist approach. *Evaluation & Research in Education*, 13(3), 144-156.
- Laurillard, D. (2002). *Rethinking university teaching: A conversational framework for the effective use of learning technologies* (2nd ed.). London: RoutledgeFalmer.
- Mayer, R. E. (2001). *Multimedia Learning*. Cambridge University Press.
- Mayer, R. E., Fennell, S., Farmer, L., & Campbell, J. (2004). A personalization effect in multimedia learning: Students learn better when words are in conversational style rather than formal style. *Journal of Educational Psychology*, 96(2), 389-395.
- Paivio, A. (1990). *Mental representations: A dual coding approach*. Oxford University Press, USA.