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# 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

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# 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

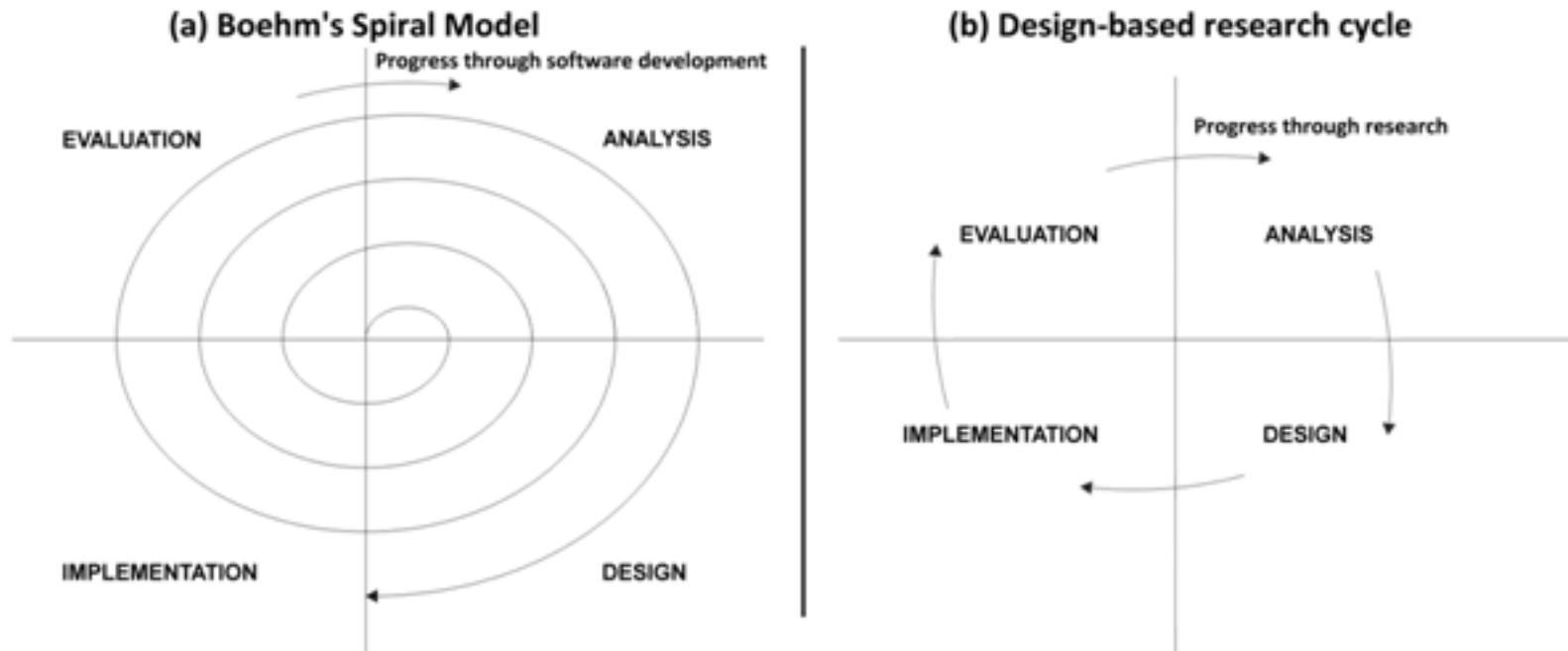
High incidence of SpLDs including dyslexia, autistic spectrum conditions

Aiming to promote greater inclusivity/level the playing the field

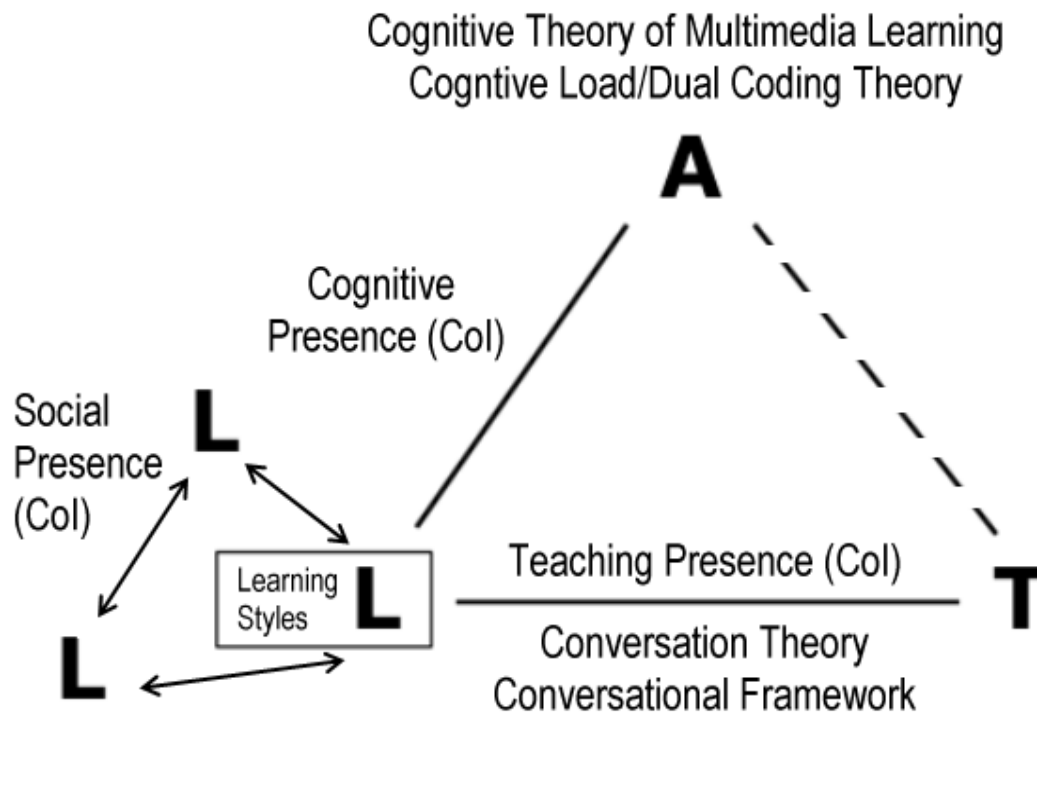
Desire to engage students with assessment *for* learning

Need to provide timely, usable, and effective feedback

## DBR Cycles and Software Engineering Models

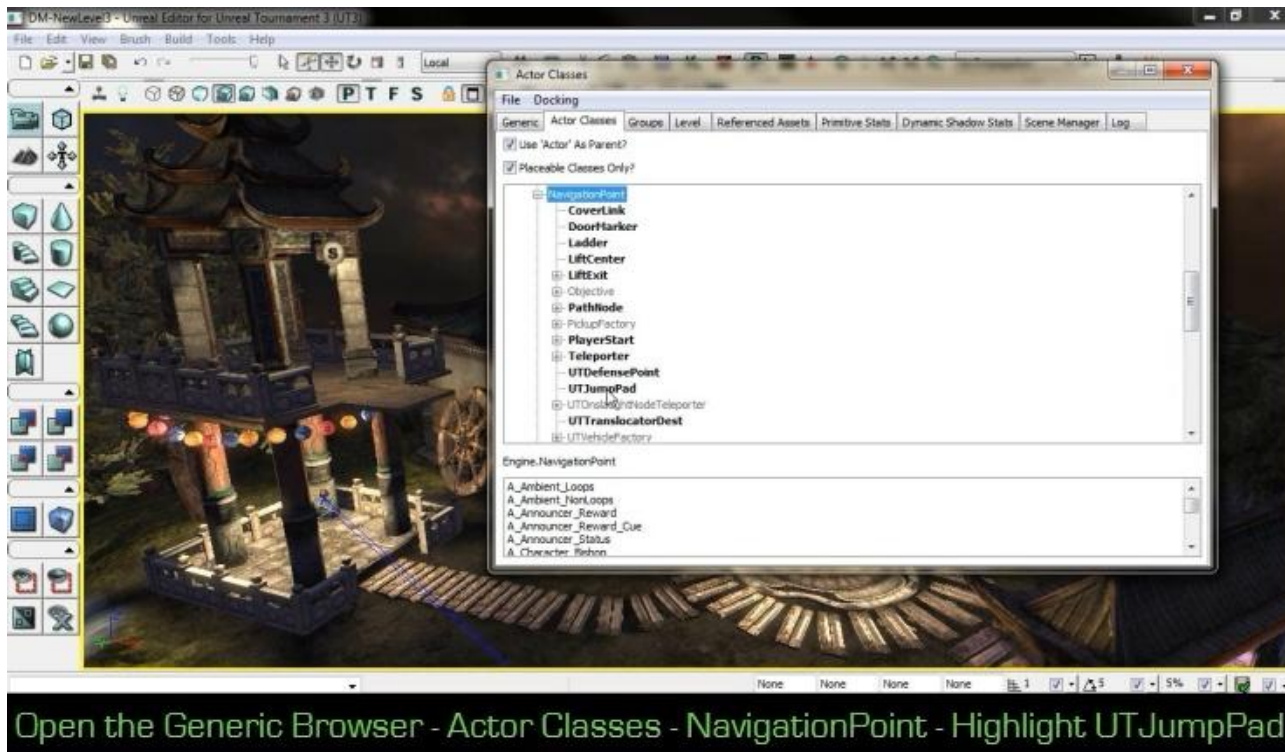


# Theoretical Backdrop



# Three Research Cycles: First Cycle

## Introduction of Instructional Tutorial Videos (ITVs)

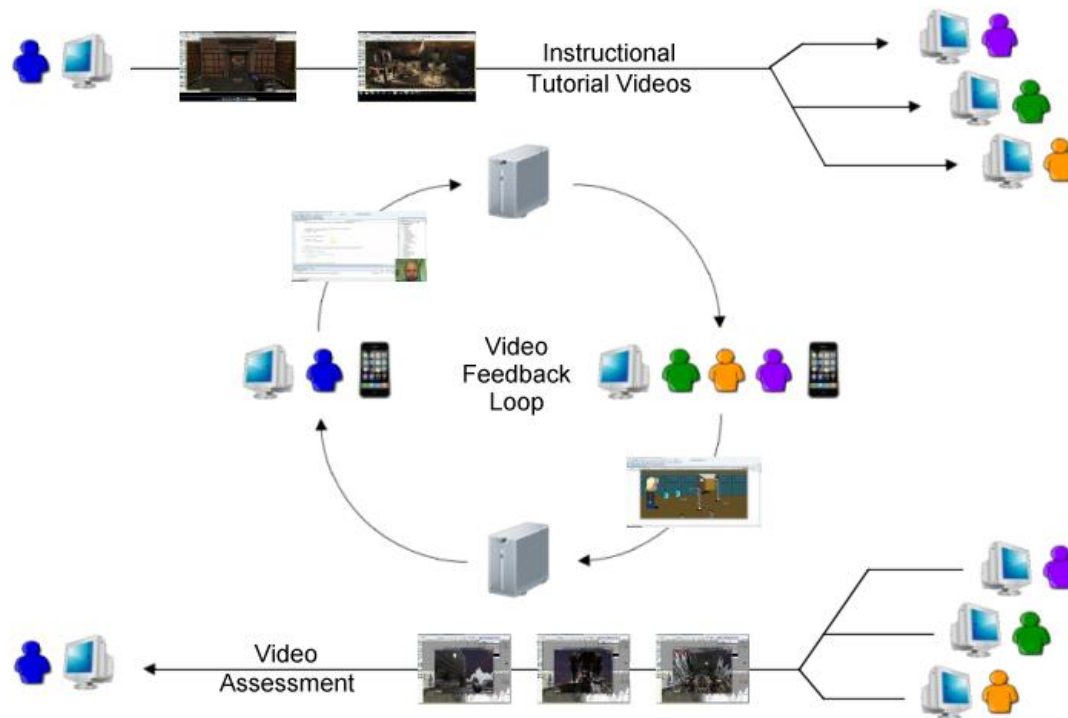


Inspiring tomorrow's professionals

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

# Three Research Cycles: Second Cycle

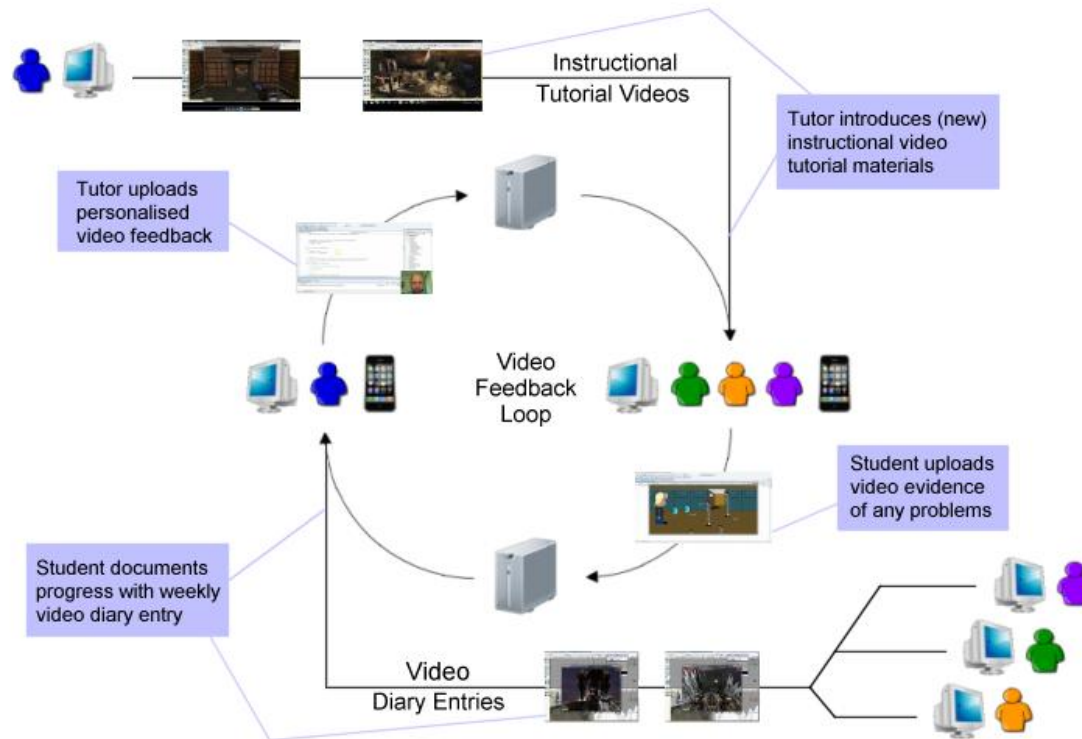
## Design, Implementation and Evaluation of VEA/VEF Techniques



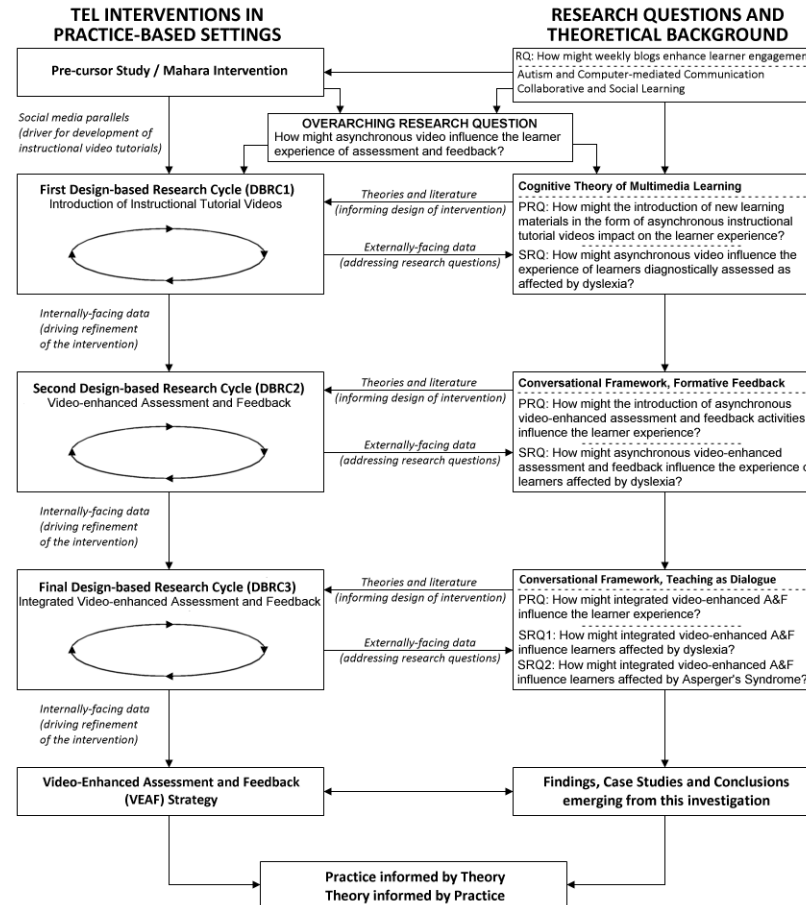


# Three Research Cycles: Third Cycle

## 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.”*



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# **Any Questions?**

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Inspiring tomorrow's professionals

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