

Design dimensions: In-depth retrospective studies of K-12 science curriculum design

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In-Depth Retrospective Studies of K-12 Science Curriculum Design

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Project Overview

Design and development are critically important to the educational enterprise. Unfortunately, there is little *research* on which *design and development processes* produce optimal outcomes for curricular materials intended for large-scale implementation. The Design Dimensions project asks: *Across phases of design (analysis, development, and evaluation), what processes and strategies are critical to successfully obtain large scale implementation with significant impacts on learners?* This collaborative project includes two distinct lines of research. TERC and the Lawrence Hall of Science are leading a series of ‘deep dive’ studies that examine, in depth, the process of curriculum design through retrospective case studies and ‘live design’ activities. The University of Pittsburgh is leading a series of ‘broad orientation’ studies that examine patterns of curriculum design across a wide range of projects.

$$\text{Dimensions} = Y1(\text{Retro}_{\text{TERC}} + \text{Retro}_{\text{LHS}} + \text{PortfolioReview}) + Y2(\text{Live}_{\text{TERC}} + \text{Live}_{\text{LHS}} + \text{BroadInterviews})$$

Theoretical Framing

Key challenges to having significant impact on learner outcomes at scale

Designing for Deep Understanding and Rich performance

- Knowledge of scientific ideas, inquiry, discourse
- Ability to apply, refine, and advance their knowledge

Designing for Social and Cultural Experiences

- (Social) spoken and/or written interactions mediated by social norms
- (Cultural) first and second hand engagements with the knowledge, beliefs, expectations, values, and practices of an interacting group
- Occur inside and outside the classroom as components of science teaching and learning

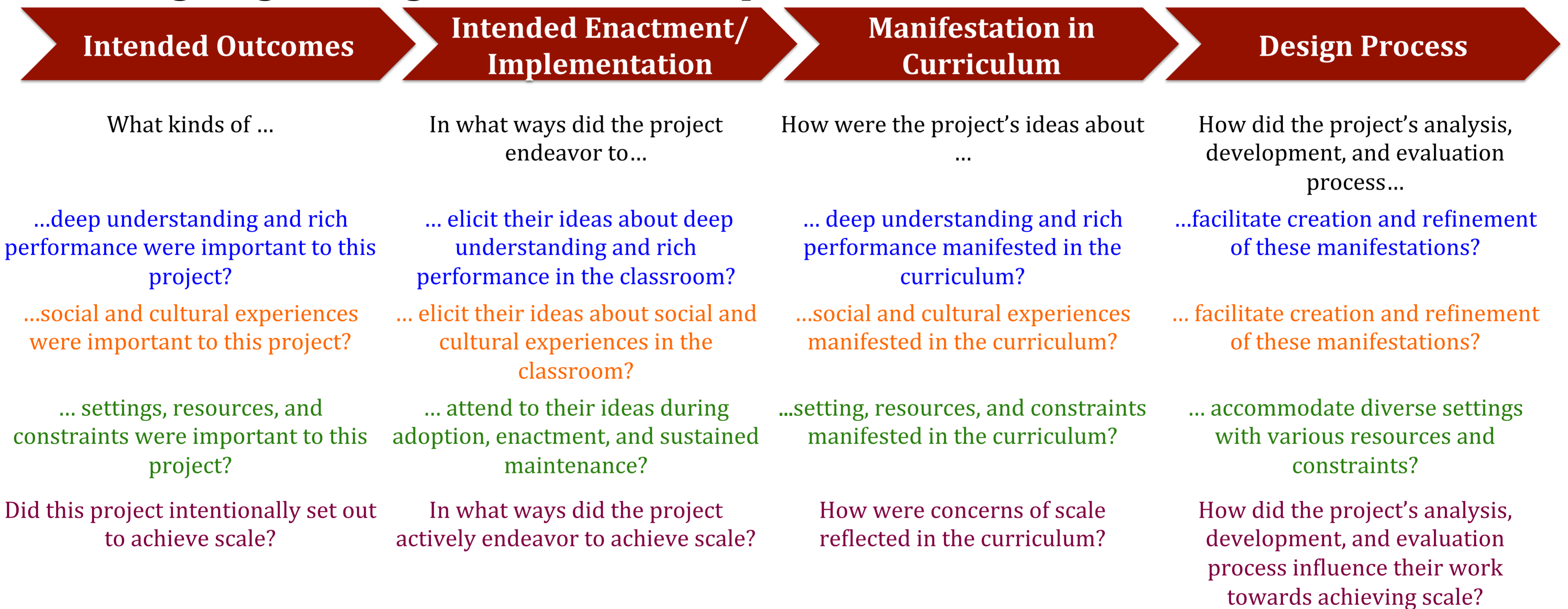
Designing for Implementation in Diverse and Resource-Limited Settings

- The adoption, enactment, and sustained maintenance of an innovation...
- ... across diverse educational settings and critical resources and constraints

Designing for Scale

- Depth, sustainability, shift in ownership, spread (Coburn, 2003)
- Learner outcomes

Investigating challenges in curriculum representations



Methodology

