

Designing for Productive Adaptations of Curriculum Interventions

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Executive Summary

Teachers face a balancing act between being faithful to the goals articulated by curriculum developers and local policy makers and being responsive to the interests and resources of students, parents, and local community members, as well as their experiences as practitioners. A commitment to fidelity reduces the interactional focus of instruction and instead emphasizes inflexible and less intentional uses of curriculum, which limit teachers' ability to be responsive to their local classroom's needs as they arise. The fidelity perspective thus privileges a few stakeholders while diminishing the importance of local responsiveness.

Design-based implementation research (DBIR) conceives of curriculum use as an inherently interpretive, and thus responsive, process. DBIR also emphasizes multiple layers and actors involved in negotiating features of classroom practice. In productive adaptations, teachers effectively respond to the dilemma of being faithful to the intentions of curriculum developers and policy makers while also being responsive to the characteristics and resources in local contexts.

Criteria for Productive Adaptations

The criteria for productive adaptations stem from assumptions that productive adaptations are responsive to the local context, reflect the design principles of the curriculum developers, and are geared toward forms of pedagogy that are both ambitious and equitable. Thus, productive adaptations entail high-level engagement for all students in practices that are associated with deep learning in a discipline. Furthermore, we argue that an important way teachers can be responsive to students is to design classroom discourse practices that elicit and build from students' linguistic and cultural resources and integrate these practices into iterative cycles of revision and curricular adaptation.

Productive adaptations: (1) balance the interests and goals of multiple stakeholders, who include students, parents, and their communities; (2) help students make cultural and discursive connections between the reasoning practices of their home communities and those of the classroom; and (3) maintain or even enhance the task complexity intended by the curriculum developers while providing avenues for broad participation in valued disciplinary practices. Making productive adaptations is a kind of advanced professional practice that requires different instructional knowledge and skills, and so new models of professional development are likely needed to support teachers in this practice.

Case Examples in Mathematics and Science

The role of curriculum designers and professional developers in helping teachers adapt materials in ways that meet the intentions of the curriculum designs and address the demands of their local contexts is illustrated through qualitative case analyses from mathematics and science classrooms. These cases describe the enactment of and challenges associated with productive adaptations.

The mathematics cases come from the NSF-funded ACCLIME project (Choppin, 2008), which focused on teacher-initiated adaptations to the Connected Mathematics Project (CMP) curriculum program (Lappan et al., 2006). The data collection involved videotaping 12 teachers' enactments of instructional units. Case examples of adaptations are drawn from two teachers.

The science cases come from the NSF-funded Contingent Pedagogies (CP) project, which focused on designing tools to help middle school Earth science teachers productively adapt their formative assessment practices. Twelve teachers implemented the CP tools, which included *pedagogical patterns* and *classroom talk moves*. The science example highlights one teacher's implementation of CP adaptations.

Recommendations for Supporting Productive Adaptations

The examples from mathematics and science illustrate two key themes. First, teachers can engage in systematic observations over a span of years that lead to adaptations that are productive in terms of (1) building from student thinking in ways that are responsive and informative, (2) maintaining or enhancing the complexity of the tasks, and (3) following the intentions of the curriculum developers. Second, it is possible to anticipate adaptations that are likely to be productive through a process of co-design in which teachers and curriculum developers create and adapt tools to facilitate productive adaptations.

These examples point to the need for resources to support teachers in enacting productive adaptations that are responsive to multiple stakeholders, reflexively related to responsive discourse practices, and maintain or enhance task complexity and engagement. Opportunities to co-design tools and participate in professional development with colleagues as well as educative curriculum materials can help teachers to identify how to adapt tasks based both on local context and an understanding of curriculum developers' intentions. Teachers find it difficult to elicit, value, and build on all students' ideas both in terms of asking the right types of questions at the right time. Thus, resources, such as questions to pose to students and follow-up questions to probe for additional thinking, may help teachers anticipate the range and types of student conceptions, engage in dialogic interactions that inform them about where their students are at, and thereby allow them to adapt to address their students' needs. The findings from these cases also suggest that with increased communication (via wikis or other open-sourced web sites), local communities can determine how elements of the curriculum will work for their students and where their students may need additional supports or different experiences.

Adaptations to curricula are inevitable and must be supported both in the design phase by curriculum developers and in the planning and enactment curriculum phases with teachers.

Productive adaptations, however, are not sustainable without broader support within the larger infrastructure. While adaptations can be anticipated to an extent, there should also be some intentionality in providing resources that facilitate adjustments that are specialized for a teacher's classroom and give the teachers the tools to make informed and productive adaptations.