

PRODUCTIVE FAILURE AS A CATALYST FOR TRANSFORMATIONAL THINKING

A ROUND TABLE PRESENTATION

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EXTENDED ABSTRACT

This roundtable session engaged participants in thinking about how Kapur's (2008) productive failure model can promote transformational thinking in college classroom settings. The productive failure model for problem solving is based on the idea that students have a greater capacity to understand novel concepts when they are initially afforded opportunities to problem solve, even though the problem-solving activity may not produce correct answers (Kapur & Bielaczyc, 2011). Productive failure tasks must provide context in order to activate prior knowledge and initiate multiple representations; encourage students to cultivate a critical analysis of the targeted concepts, and allow for connections between failed attempts and successful endeavors of the targeted concepts. The use of this model delays initial instruction of a novel concept in order to allow students to grapple with these concepts. The delaying process is intended to allow students time to better understand why the targeted concepts—representations and methods—are assembled in the way that they are (Kapur & Bielaczyc, 2011).

Presenters explained the productive failure model, explained findings from current research, provided examples of tasks, and shared how the productive failure model created puzzlement and promoted learning in a ninth-grade mathematics classroom (Author, 2014). This current research showed how students persisted during a productive failure modeled task and revealed three main themes: (a) the group's processes of interaction, (b) the roles the group members played during the task, and (c) the problem solving approaches the group utilized during the task.

We demonstrated ways in which productive failure aligns with elements of transformative learning (Mezirow, 1997), beginning with the disorienting dilemma that the productive failure model can provide for learners. The disorienting dilemma causes a disequilibrium that evokes new ways of knowing to aid in a paradigm shift. Since the productive failure model promotes error making to assist students in making connections between failed attempts and successful learning gains, students naturally experience disequilibrium during their learning process. Therefore, the productive failure model could be used as a catalyst for transformational thinking.

Participants discussed ways of adapting Kapur's model for use in college classroom settings, considering applications for teaching in their own disciplines. Questions for discussion: What are faculty members already doing in their classrooms to invoke puzzlement? How might the productive failure model differ with adult learners? What types of assignments would best align with the productive failure model? How can the productive failure model serve as a catalyst for transformative learning?

Future research is needed to determine if this model would have the same learning outcomes in a college classroom setting for a different course of study. The round-robin table provided necessary feedback to determine how a productive failure model task could be utilized as a catalyst for transformational thinking in a college classroom.

SELECT REFERENCES

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