

Public Abstract

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Formative assessment is essential for improving student learning. Formative assessment research has predominantly used cognitive learning theories. In this dissertation study, I used sociocultural learning perspectives to understand how formative assessment supported student learning during interaction and how it empowered students. This dissertation included three manuscripts.

The first manuscript was a conceptual study. I developed a new formative assessment cycle that was built on sociocultural perspectives and prior formative assessment cycles. The model included four steps: building community, monitoring community, community mediation, and redefining goals. These steps were described in detail with examples, and the roles of the teacher, learners, and peers were discussed. Future researchers may potentially use the model to understand formative assessment practices. Practicing teachers and teacher educators may benefit from the provided examples for classroom implementation of the model.

In the empirical part of the dissertation, Chapter Three and Chapter Four, the participant teacher, who was a high school physics teacher, was selected from teachers that had been actively using iPads in their classrooms. This study was conducted at a public high school in the Midwest United States that had a diverse student population. Data were collected across eighteen class sessions. Primary data sources included video recorded observation of class sections, iPad applications, and teacher interviews. Supporting secondary sources included pictures taken during observations, lesson plans, assessment examples, student-works, and student interviews.

In the second manuscript, I examined a high school physics teacher's technology-enhanced classroom to understand the impact of technology on the teacher's formative assessment practices, and how the iPad influenced the formative assessment process, by using sociocultural learning perspectives. The participant teacher's formative assessment practices were described (members, tools, and classroom norms). Results showed that influences of the iPad on the formative assessment process were: 1) transforming classroom community, 2) empowering students, and 3) facilitating evidence-based discussions. This study shed light on: the impact of technology use on the teacher's formative assessment practice, how the impact rebuilt the classroom norms, and how technology use impacted student identity development.

In the third manuscript, I focused on the most important aspect of formative assessment - feedback. I examined how well iPad applications (apps) supported providing feedback. Then, I compared the app affordances with teacher practice. To enable analysis of data, I enhanced Hatzipanagos and Warburton's (2009) feedback dimensions. Analysis revealed app diversity in supporting different feedback dimensions, and the teacher, through additional discussion and interactions with students, was able to support dimensions that an app did not. The provided examples of app affordances and teacher practices may be beneficial to prospective and practicing teachers. Application designers may benefit from this study towards improving their apps to support effective feedback.