

# Designing Purposeful Student Interactions to Advance Synchronous Learning Experiences

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## ABSTRACT

This article brings together the results of a self-study conducted by two instructors of the same course for mathematics teacher leaders in a synchronous online learning environment using the videoconferencing tool Blackboard Collaborate. The combined self-study focused on the authors' instructional decision-making and on their use of scaffolded discourse to create a collaborative learning environment for teacher leaders in mathematics education. Findings indicate that two specific interactions were emphasized to highlight student engagement within the course: student-student interactions and student-content interactions. Results challenge the perception of participation as engagement and suggest the value of creating purposefully planned learning opportunities to engage students in online synchronous learning.

## KEYWORDS

Blackboard Collaborate, Mathematics Coaching, Mathematics Specialists, Self-Study, Student Engagement, Synchronous Online Learning, Teacher Education, Video Conferencing Tools

## INTRODUCTION

Online and blended courses are in increasing demand as an option for teaching and learning in higher education (Allen & Seaman, 2008; Yamagata-Lynch, 2014; Young, 2011). For teachers seeking advanced degrees or additional licensure endorsements, online options represent a viable means for balancing school, work, and family obligations. Due to this increasing demand and requests from interested teachers, colleges of education have responded with more online course offerings (Young, 2011). However, within online and blended learning research, there are a limited number of studies on synchronous online teaching settings (Yamagata-Lynch, 2014). With limited research available on synchronous online learning, we aim to explore how university faculty can transform online courses to create more meaningful, collaborative experiences for students.

This paper brings together the results of a self-study conducted by two instructors of the same course for mathematics teacher leaders in a synchronous online learning environment. The authors each taught the course in different semesters and explored findings and commonalities across their

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sections. This study responded to the following research question: How can an instructor foster and support meaningful collaboration in a synchronous online learning environment? In considering this question, we focused on our own decision-making as instructors and the methods we attempted to use to create a collaborative learning environment for teacher leaders. In this paper, we examine the use of breakout rooms and other collaboration tools available in synchronous learning environments.

## **SYNCHRONOUS ONLINE TEACHING & BLENDED LEARNING**

Much of the online learning research literature focuses on asynchronous forms of interaction such as discussion boards, blogs or other tools that allow for discussion to occur, but which are typically text-based (e.g., Barab, MaKinster, & Scheckler, 2004; Dede, 2006; Tuapawa, 2016; Wang, 2007). In terms of non-text-based interactions, research using asynchronous video for discussion is emerging and indicates that it supports students' learning and engagement (Borup, West, & Graham, 2012). While the technology for synchronous online teaching is becoming widely available, there are limited research studies about teaching and learning in the environment (Starling & Lee, 2015; Yamagata-Lynch, 2014). Synchronous online teaching can include the use of tools such as video, audio, text-based chat features, breakout rooms and virtual whiteboards while using platforms such as Blackboard Collaborate, Adobe Connect or WIMBA (Shi & Morrow, 2006; Skylar, 2009). We define synchronous online teaching and learning to mean a learning environment in which students and teachers can interact in multiple modes simultaneously including audio, video, visual, and text-based modes of communication, interaction and representation. Similar to Laurillard's discussion of collaborative technologies, we ask "How do we ensure that pedagogy exploits the technology, and not vice versa?" (p. 6).

An ERIC search for "synchronous online" found 113 results of which 92 were peer-reviewed articles (search in spring 2016). Each of the 92 articles was coded for both the student population addressed and the inclusion of web-based videoconferencing tools for teaching. Thirty-five of these studies included videoconferencing in addition to audio or text tools for interaction in a class setting that mirrored more traditional face-to-face classes. Our review of the literature focuses specifically on 11 of those 35 studies that examine the use of such tools for teacher education and development for both in-service and pre-service teachers, and emphasize themes found in our teaching: strategies for teaching with web-based videoconferencing tools, community development and student collaboration, and student perceptions of the synchronous online environment. In these studies referenced and reviewed below, the "students" may be either K-12 teachers or pre-service teachers enrolled in a course. However, we have used "students" to differentiate the learner from the instructor or teacher of the online course itself.

A critical component of synchronous online instruction is the ability for students to collaborate with each other and interact in real time with the instructor using audio or video. As a result, our context has more in common with blended learning settings that incorporate online and face-to-face teaching than studies of synchronous online learning, and we situate our study within frameworks for blended learning in which modes of learning include face-to-face and online components to support collaboration and community development (Garrison & Vaughan, 2008). For example, "blended learning provides a means to rethink the educational experience from the perspective of building learning communities that will support collaborative thinking and learning effectively, efficiently and conveniently" (Garrison, 2015, p. 45). Blended or hybrid learning environments can include opportunities for students to use synchronous web-based videoconferencing as part of developing community and encouraging interaction (Skylar, 2009; Smith, Wilson, Banks, Zhu, & Varma-Nelson, 2014; Vu & Fadde, 2013). This sense of building learning communities via the thoughtful use of technology is a central component to our work and other studies of synchronous online teaching and learning for teacher development and education (Francis & Jacobsen, 2013; Hodges & Cady, 2013; Keamy & Selkrig, 2013).

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