Chapter 53

Engaging a Workbench Dialectic Inquiry Model in an Online Master's Degree Program:
TPACK Development Through Communities of Inquiry

Henry Gillow-Wiles
Southern Oregon University, USA

Margaret L. Niess
https://orcid.org/0000-0002-1673-0978
Oregon State University, USA

ABSTRACT

This cross-case descriptive study suggests a model for designing online courses that supports TPACK development through communities of inquiry. Borrowing from the world of science research literature, a workbench dialectic inquiry model was engaged in designing a small group-large group dynamic. Mimicking scientists at the workbench, the participants formed relationships in small groups to develop ideas about TPACK, presented their ideas to the larger, whole-class group, then returned to the small groups to integrate feedback. This dynamic group interaction structure provided the participants with the space to develop their TPACK thinking in ways that supported the transition to cognitive discourse. Analysis of the forum postings revealed the complexity of the participant interaction and suggested that facilitating student community engagement supported the development of their TPACK. Course design details are provided. Further research directions might include applying the workbench dialectic inquiry model in other educational contexts and with larger student populations.

INTRODUCTION

The nature of an online environment creates limitations to the interactions students depend on to navigate the tasks associated with learning. Critiques of online education often focus on issues of reduced student satisfaction, perceived isolation, and inability to form the supporting relationships often found in face-to-face learning experiences (Jaggars, 2014; Valenzuela, Fisher, Whale, & Adapa, 2013). Literature provides insight into the development of a variety of pedagogies and strategies where community building is facilitated through leveraging different technologies. Real-time, interactive technologies such as instant messaging applications and streaming video applications have been utilized to provide a semblance of immediacy, where students are able to form relationships and collaborate in learning communities (Kim, Glassman, Meredith, & Morris, 2015). Other research has investigated how text-based, asynchronous technologies, such as forums, can provide an environment where students are able to form communities of inquiry where they might engage in meaningful discussions and build their knowledge (Kovanović, Gašević, Joksimović, Hatala, & Adesope, 2015; Niess & Gillow-Wiles, 2013).

Regardless of the technologies used, one recurring theme throughout the literature is the need for instructors to be proactive in how they facilitate the formation and development of online learning communities (Akyol & Garrison, 2008; Cho, 2011; Garrison & Akyol, 2013; Garrison, Anderson, & Archer, 2001; Hew, 2015; Niess & Gillow-Wiles, 2013; Rubin, Fernandes, & Avgerinou, 2012; Swan & Shih, 2005; Tucker, Willis, Blocher, & de Montes, 2002). Leaving students to fend for themselves in forming relationships often results in a continuation of students' perceptions of isolation and lack of connections with other students and the instructor (Phirangee, Epp, & Hewitt, 2016; Jackson, Jones, & Rodriguez, 2010).

Targeted, structured course design is essential for students to transcend the sparse online learning environment and realize the strengths and opportunities available in a digitally mediated context (Costley, 2016). Purposeful course design providing students with opportunities to engage with other students and the instructor in creating their knowledge gives students a sense of place and belonging that increases their satisfaction and their success (McDaniels, Pfund, & Barnicle, 2016). One potentially useful model for designing courses that support student engagement is the dialectical model of inquiry found in the science community, referred to as a 'workbench model'. This model suggests potential insights for online course structures and activities supporting students in both the creation of communities of inquiry and in the creation of an individual and shared knowledge. These communities of inquiry might also provide the motivation, communication, and structure necessary to sustain individual inquiry (Magnusson, Palincsar, & Templin, 2004).

The weaknesses and drawbacks of situating learning in an online environment create a need for a supported, instructor-created learning trajectory where social presence is established to facilitate cognitive presence (Chiu, Hsu, & Wang, 2006). The structure provided by the workbench dialectic model potentially provides a framework for students to engage in the kind of organic interactions that develop social presence while serving as a pathway to transition social conversations into cognitive discourse.

One student population currently needing access to online learning is for teachers to extend their learning beyond their pre-service teacher preparation programs. The explosion of digital technologies as educational tools requires that teachers implement pedagogical strategies in vastly different ways than how they learned their content. These new instructional tasks call for a teacher knowledge more advanced than simply understanding the subject matter content. It calls for teachers who have a knowledge that integrates their content with new pedagogies and new technologies (Koehler & Mishra, 2006). This

21 more pages are available in the full version of this document, which may be purchased using the "Add to Cart" button on the publisher's webpage: www.igi-global.com/chapter/engaging-a-workbench-dialectic-inquiry-model-in-an-online-masters-degree-program/312770

Related Content

The E-Mentoring Network for Diversity in Science and Engineering
David Porush (2010). *Cases on Online Tutoring, Mentoring, and Educational Services: Practices and Applications (pp. 12-22).*
www.irma-international.org/chapter/mentoring-network-diversity-science-engineering/38022

Feature Extraction of Dialogue Text Based on Big Data and Machine Learning
Xuelin Liu, Hua Zhangand Yue Cheng (2024). *International Journal of Web-Based Learning and Teaching Technologies (pp. 1-15).*
www.irma-international.org/article/feature-extraction-of-dialogue-text-based-on-big-data-and-machine-learning/337602

Teacher Training and Online Teaching: Bridging the Gap
Krista S. Chambless, Kelly Moserand Sandrine Hope (2022). *Handbook of Research on Effective Online Language Teaching in a Disruptive Environment (pp. 221-246).*
www.irma-international.org/chapter/teacher-training-and-online-teaching/293373

Vmware as a Practical Learning Tool
Eduardo Correiaand Ricky Watson (2006). *Tools for Teaching Computer Networking and Hardware Concepts (pp. 338-354).*
www.irma-international.org/chapter/vmware-practical-learning-tool/30437

Evaluation of Interactive College Piano Teaching's Effect Based on Artificial Intelligence Technology
Ying Liu (2024). *International Journal of Web-Based Learning and Teaching Technologies (pp. 1-16).*
www.irma-international.org/article/evaluation-of-interactive-college-piano-teachings-effect-based-on-artificial-intelligence-technology/335079