Chapter 26
Transforming Teaching for Virtual Environments:
Developing Preservice Teachers' Online TPACK

Irina Lyublinskaya
https://orcid.org/0000-0002-2143-5076
Teachers College, Columbia University, USA

Xiaoxue Du
https://orcid.org/0000-0001-5222-1751
Teachers College, Columbia University, USA

ABSTRACT

This chapter describes pedagogical practices and teaching strategies with instructional technology used in an online summer course with preservice K-12 teachers. The course provided preservice teachers (PSTs) with experiences in using technology in K-12 classrooms from both students' and teachers' perspectives, engaged PSTs in active explorations of various K-12 curriculum topics using technology that could enhance high-impact teaching strategies, and supported PSTs in development of virtual lessons using instructional technology. The study identified effective practices with instructional technology to support preservice teachers' development of Technological Pedagogical Content Knowledge (TPACK) for their own online teaching. Study findings suggest that online immersive experience created a virtual student-centered space to nurture collaborative inquiry and that contributed to the growth of PST's TPACK. However, this experience also brought challenges and concerns for sustaining and transforming teaching and learning with instructional technology to an online environment.

DOI: 10.4018/978-1-7998-7222-1.ch026

INTRODUCTION

Transforming the traditional in-person classroom to a virtual environment while maintaining student-centered teaching has challenged K-12 and higher education teacher educators during COVID-19 pandemic. This chapter describes pedagogical practices and teaching strategies with instructional technology used in an online summer course with preservice K-12 teachers. The goal of the course was to provide preservice teachers (PSTs) with experiences in using instructional technology in K-12 classrooms from both students' and teachers' perspectives, engage PSTs in active explorations of various K-12 curriculum topics using technology tools that could enhance high-impact teaching strategies, and support PSTs in developing virtual lessons with instructional technology. The development of this course aimed toward identifying pedagogical practices with technology most effective for student learning in a virtual environment and in supporting development of PSTs' Technological Pedagogical Content Knowledge (TPACK) for online teaching in K-12 classrooms. The results inform teacher educators about successes and challenges for transforming teaching and learning with technology to an online environment.

BACKGROUND

In order to develop engaging and meaningful virtual learning experiences for the PSTs, the authors first analyzed learning theories and frameworks that provided foundations for different models of online education. Next, the chapter explains the multimodal model for online education (Picciano, 2017) that provided a blueprint for the development of the authors' course structure, content, and pedagogical practices.

Learning Theories

Learning occurs in a complex environment with mutually influential relations among individuals and contexts. Guided by the constructivist framework (Vygosky, 1978), the learning environment has the potential to support high cognitive demand tasks with the effective use of technology. With appropriate technology tools, learners could actively explore problems, formulate questions in prompting multiple solutions, propose problem-solving strategies, and take ownership of the knowledge construction process. Prior to COVID-19 pandemic, the constructivist approach has been used predominantly in in-person settings to create a student-centered learning environment. The pandemic raised important questions as to whether a virtual environment could support a constructivist approach to teaching and learning, and how instructional technology could be effectively integrated into virtual learning experiences.

Social constructivism built on the foundational constructivism theory by emphasizing the role of social interaction with others and the collaborative learning process in knowledge construction. Lave and Wenger (1991) emphasized the importance of social context in learning, and specifically the importance of a community of practice. The acquisition of knowledge and skill involves the engagement of a social community of practice, which might consequently affect individuals' confidence, self-esteem, and other non-cognitive factors. Further research is needed to identify effective instructional practices that bring social context and support development of student communities of practice in virtual settings.

As various formats of online education became more and more prominent at all levels of education, education researchers started to look for ways to expand these learning theories to online education. In addition to situating the social components of the knowledge construction process, cognitivism theory