Chapter 19
Open Source Online Learning in Rural Communities

Gary L. Ackerman
Windsor (Vermont) School, USA

ABSTRACT

Anyone is free to use open source software without the need to purchase the right to install it. Despite its appeal to school and technology leaders in rural communities, they are less likely to install it than others. In this chapter, three cases in which open source technology was installed to support teaching and learning in three rural communities are described. In each, the systems were deployed and refined using decision-making grounded in educational design research. The projects are detailed, and the method of technology planning is assessed. Unanswered questions are also addressed.

INTRODUCTION

Educational communities face many challenges as they seek to prepare students for the technology-rich future in which they will live and work. Educators must create curriculum that reflects rapidly changing content expectations (Dede, 2010; Susskind & Susskind, 2015) and that reflects emerging and incompletely understood economic, political, and cultural norms (Miller, 2011; Wokurka, Banschbach, Houlder, & Jolly, 2017). In addition, school leaders must support teachers as they create classrooms that reflect new discoveries from the learning sciences (Benassi, Overson, & Hakala, 2014; Sawyer, 2008). All of these changes can be traced, at least in part, to rapidly evolving information and computer technology and its effects on the creation and dissemination of information (Benkler, 2006). For rural communities, these challenges are exacerbated by several factors (Beeson, 2001). Rural schools tend to be smaller, thus they lack the economy of scale that can provide greater resources for larger populations (Tholkes & Sederberg, 1990). Because they are more widely dispersed, travel time between rural schools can limit the responsiveness of professionals who are shared among multiple sites. Because they serve small populations, rural educators frequently teach outside their area of specialty (Miller, 2012).

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Advocates suggest the technology used to deliver online learning can be adapted to address many problems faced by educators and school leaders. For example, school leaders can use online learning to expand opportunities for students (Dabrowski & Lodge, 2017), facilitate teachers' professional learning (Baran & Correia, 2014), and support authentic learning and assessment (Herrington, Reeves, & Oliver, 2006). Platforms for online learning are available from both proprietary publishers and from open source communities; open source platforms can be obtained and installed at no cost to the user. Ostensibly, open source tools will have wide appeal to school and technology leaders in rural communities because of the minimal costs. Despite this, there is evidence rural schools are less likely than suburban and urban schools to use open source tools to manage information and to promote learning (Kimmons, 2015). In this chapter, the author describes three projects in which open source distance learning technologies were applied to the professional needs of educators working in rural communities in the northeast United States; the planning and decision-making that focused the projects were grounded in educational design research (McKenny & Reeves, 2012).

Open Source Technology

A growing community produces open source software and open educational resources (OER) communities have grown and their products have begun to compete with and complement commercial products. They are also increasingly used in both K-12 and higher education. Baker (2017) suggested open resources are defined by dimensions of transparency and freedom, and these characteristics can be traced through the information products created by educators for many generations. Transparency is that characteristic of open resources that allows users to access and modify the original works; freedom is that characteristic that allows use of the products without the need to purchase or license the work. More importantly, however, freedom entails the rights to create and distribute derivative works.

The software used in these projects is published and licensed under the GNU General Public License (Free Software Foundation, 2016); the Apache License, Version 2.0 (Apache Software Foundation, 2017); or the Creative Commons Attribution-ShareAlike 3.0 Unported License (Creative Commons, n.d.). All of these licenses fit Baker's (2017) dimensions of transparency and freedom. In the cases described in this chapter, school and technology leaders obtained copies of open software, installed it per the conditions of the license, and customized it using the options available in the software. In no case did the author or any other individuals involved with the projects vary the source code of the software or create derived works.

Educational Design Research

This chapter describes both the software used to support virtual teaching and learning as well as the planning decisions and processes that led to changes in the ways the technology was configured and used. In these cases, the school and technology leaders followed a multi-step process grounded in educational design research (McKenny & Reeves, 2012) Educational design research is a variety of user-based research (Stokes, 1987) in which researcher-practitioners seek to simultaneously understand phenomena and to design interventions that meet human needs. McKenny and Reeves (2014) described educational design research as "the iterative development of solutions… to practical and complex educational problems" which leads to "new knowledge that can inform the work of others" (p. 133). The iterative processes are undertaken for three distinct phases (see Figure 1), and each phase finds researcher-practitioners