

Chapter 2

Media Literacy as a Pathway to Bridge the Digital and STEM Divides: Interest Driven Media Projects for Teachers in the Trenches

Lesley K. Smith
University of Colorado, USA

Anne U. Gold
University of Colorado, USA

Juliette N. Rooney-Varga
University of Massachusetts, USA

David J. Oonk
University of Colorado, USA

Deb Morrison
Broomfield Heights Middle School, USA

ABSTRACT

One of today's equity challenges is the need to increase media literacy among all students, especially traditionally marginalized students. Media literacy is defined by the way that particular student groups are limited in their engagement with digital resources that promote critical thinking and problem solving. This chapter provides implementation models for seven different types of media projects focused on climate change science that have been successfully piloted with 78 secondary students primarily from impoverished backgrounds. Results show that students' experiences while participating in these projects were transformational. Both the digital and STEM divides were bridged by including science-focus media projects.

INTRODUCTION

The student population in the U.S. is increasingly more racially, ethnically, and linguistically diverse. Nationally, the white student population was 60% in 2001, while in 2011 it was 52% (NCES, 2015). This shift is mostly a result of an increasing Latino population, which, during the same period of time, increased from 17% to 24%, while African American, Asian/Pacific Islander, and Native American/Alaskan Native populations all stayed relatively stable. With the increase in the Latino population, the

DOI: 10.4018/978-1-4666-9616-7.ch002

number of students in English Language Learning status has also increased from 8.7% to 9.1% between 2002 and 2011. These trends have been occurring for decades now and are predicted to continue into the future, making American schools much more racially and linguistically diverse.

Students in U.S. schools also are on average getting poorer (NCES, 2015). In the 2000-2001 school year, the national participation in school-based free and reduced lunch programs (FRL), a measure of family wealth, was 38%. By the 2010-2011 school year, 48% of students in U.S. public schools were enrolled in FRL programs. This change is significant as students in poverty may be less likely to have access to the same types of physical and cultural resources as more affluent students. For example, in terms of physical resources, impoverished students are less likely to have current computer technology, software, and stable Internet connections (Eamon, 2004). Additionally, in terms of cultural resources, economically disadvantaged students have challenges in fully accessing science-based forms of communication in the classroom that can often influence the way in which they see themselves as participants in these activities (Brown, 2006; see also Chapter 11 of NGSS Framework, NRC, 2012). To bridge these differences and address these challenges, schools can provide structural supports for students to help bridge language discourses (Gutierrez, Baquedano-Lopez, & Tejeda, 1999) and provide access to the latest technological resources (Vickery, 2014).

A digital divide developed in the 1990s between those with access to computers and the Internet and those without; however, that divide has shifted in more recent years. Initially, African American and Latino students had little access to digital resources, but with the increase in access to inexpensive mobile devices and mobile Internet, Latino and African American youth had increasing access to these forms of digital resources and were viewed as early adopters and mobile trendsetters (Horrigan 2009). However, the use of mobile devices by these populations may be limited to gaming, watching videos, and listening to music, and they may have limited participation in other forms of more creative digital literacy, resulting in another form of digital divide (Hargittai, E., 2011; Hargittai, E. & Walejko, G., 2008; Vickery, 2014).

While there are many ways to describe the digital divide, the term media literacy is used in this chapter to define the way that particular student groups are limited in their full participation of engaging with digital resources that promote critical thinking and problem solving (see Potter (2010) for a full range of definitions for media literacy and the skills associated with media literacy). This definition stems from work by Watkins (2012) on design literacy in which he describes this learning as the “capacity to engage in critical thinking, inquiry and discovery, and real world problem solving” (p. 9). Further, Hobbs (2010) describes five steps towards digital and media literacy: 1) Access, 2) Analyze and Evaluate, 3) Create, 4) Reflect, and 5) Act. The differential digital resource access found in different student populations impacts particular students’ abilities to engage in rich and deep ways with technology. For example, Miles (2007) discusses network literacy, the sharing of work through networks, which can be impacted by limited Internet or through lack of access to particular forms of technology. Resnick et al. (2009) add to this discussion with the term digital fluency, the need for students’ technology work to “include designing and creating, not just browsing and interacting.” To empower youth to produce and create digital media and build digital literacy, students need access to up-to-date computers, software, and technology, as well as training in media tools. Schools can play a critical role in providing access to technology and educational opportunities in order to level the playing field for all students to become literate in all aspects of digital media.

Another pathway for students to become media literate is through informal venues. Studies in informal learning environments centered on digital literacy have found that students value interest driven learn-

19 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/media-literacy-as-a-pathway-to-bridge-the-digital-and-stem-divides/141180

Related Content

The Use of Complementary Virtual and Real Scientific Models to Engage Students in Inquiry: Teaching and Learning Climate Change Science

Allan Feldman, Molly Nation, Glenn Gordon Smith and Metin Besalti (2017). *Optimizing STEM Education With Advanced ICTs and Simulations* (pp. 30-57).

www.irma-international.org/chapter/the-use-of-complementary-virtual-and-real-scientific-models-to-engage-students-in-inquiry/182597

The History and Philosophical Changes of the Environmental Reform Movement: Events and Paradigm Changes That Led to the US EPA

Donald J. Kern (2021). *Building STEM Skills Through Environmental Education* (pp. 14-48).

www.irma-international.org/chapter/the-history-and-philosophical-changes-of-the-environmental-reform-movement/262019

Using Air to Move Paper Airplanes and Balloon Rockets: The Great Race

Letitia Graybill (2017). *Cases on STEAM Education in Practice* (pp. 220-246).

www.irma-international.org/chapter/using-air-to-move-paper-airplanes-and-balloon-rockets/177516

Using Smartphones for Orientation Training for the Visually Impaired

Georgios Stylianou and Katerina Mavrou (2015). *Integrating Touch-Enabled and Mobile Devices into Contemporary Mathematics Education* (pp. 284-306).

www.irma-international.org/chapter/using-smartphones-for-orientation-training-for-the-visually-impaired/133327

Showcasing the Creative Talents in Science of the Academically Less-Inclined Students Through a Values-Driven Toy Storytelling Project

Nazir Amir (2018). *K-12 STEM Education: Breakthroughs in Research and Practice* (pp. 731-762).

www.irma-international.org/chapter/showcasing-the-creative-talents-in-science-of-the-academically-less-inclined-students-through-a-values-driven-toy-storytelling-project/190128