Chapter 7
A Laboratory for Creativity: How Youth Thrive With Design Thinking and STEAM Education

Neal Barbour
Lawrence Arts Center, USA

Becky Eason
https://orcid.org/0000-0002-5167-270X
Wordcraft LLC, USA

ABSTRACT

This chapter explores how design thinking, challenge-based learning, and project-based learning have been incorporated into a STEAM program named ARTspace at the Lawrence Arts Center in Lawrence, Kansas. Using examples of curriculum and practice undertaken over the last five years, the authors share the formation of three distinct assessment tools developed to measure metacognitive awareness of the invention process, creative self-efficacy, and the acquisition and retention of standards based STEAM content. The data presented from a three-year evaluation of the ARTspace program shows statistically significant gains in awareness of process-based thinking/practice as well as confidence in practicing innovation.

INTRODUCTION

The rapid development of technology has created an uncertain future for today's students. Although it is difficult to estimate the exact percentage of future jobs that do not yet exist today, we know that today's education needs to shift in order to prepare students to be sharp, critical-thinking, adaptive, and collaborative citizens

DOI: 10.4018/978-1-7998-2517-3.ch007

(Murane & Levy, 2017). Offering students opportunities in afterschool and summer programming that focus on the practice of creation and invention helps to build skills that can translate to this uncertain future economy. Even more beneficial than this economic argument is the data indicating that arts-based, afterschool activities create more engaged citizens. According to a 2012 study by James Catterall, children who regularly study the arts are more likely to: be recognized for academic achievement, be elected to class office, show higher achievement in math and science, win academic awards, attend college, choose a professional career, regularly read the newspaper, volunteer in their community, and vote. Enhancing the present and future lives of our students by allowing them to explore their passions and apply knowledge to practice is inherent in best practices in education.

One such program, the Lawrence Arts Center's ARTspace STEAM, integrates Dance, Performing, and Visual Arts to teach Science, Technology, Engineering, and Mathematics (STEM) concepts by allowing students to create artwork that speaks to a design challenge. Combining elements of Challenge Based Learning and Project Based Learning, this program encourages risk-taking, collaboration, informed design, STEM identity-building, and awareness of the creative process. In order to measure gains students were making, three unique and distinct assessment tools were created and a three-year evaluation of the program ran from 2015 through 2017. This chapter traces the development of the ARTspace STEAM program, examines the pedagogical aspects of its curriculum using applicable, real-life examples, and shares the assessment tools and results of the three-year evaluation.

BACKGROUND

The Lawrence Arts Center (LAC) was established in 1975 as a public/private partnership between the city of Lawrence, Kansas and local residents. The center moved to expanded 40,000 square-foot facilities in 2002, continuing community arts programs and services for individuals of all ages, interests, and backgrounds through three exhibition galleries, a 300-seat proscenium theater, two dance studios, two arts-based preschool classrooms, a half day kindergarten, a black box theater, and eight visual arts studios. In addition to being a center for visual and performing arts, modern art exhibitions, film, and lectures, the LAC provides a full complement of educational programming for ballet, modern dance, theatre, and visual arts, employing over 200 teaching artists to work with over 10,000 students and over 200,000 visitors annually *(Lawrence Art Center, 2015).* The mission of LAC is to create meaningful arts experiences with and for the community through education, exhibitions, and performances.