

# Creative Codings: Investigating Cultural, Personal, and Epistemological Connections in Media Arts Programming

Kylie A. Pepler and Yasmin B. Kafai  
University of California, Los Angeles 2331 Moore Hall Los Angeles, CA 90095  
Email: kpepler@ucla.edu, kafai@gseis.ucla.edu

**Abstract:** The focus of this poster is to turn our attention to the arts as an understudied area in the learning sciences and examine how studying the learning of arts and programming can open new avenues of research. Results from a case study analysis suggest that appropriation builds on multiple connections: cultural connections such as referencing popular iconography, personal connections such as including family pictures, and larger epistemological connections to larger bodies of knowledge.

## Introduction

Learning science researchers have paid little attention to the field of arts education as the more prominent focus has been on science, math and to a lesser degree, social studies and language arts. Among a number of reasons that can explain this absence of interest is the lack of new technologies in the arts education curriculum. Recently, the Arts Education Partnership (AEP) issued a call for research to further investigate ‘New Technologies and Arts Learning,’ noting that “[n]ew technologies...are changing the nature of arts education” (AEP, 2004). The intersection of arts and technology (called “media art” here) is a relatively new avenue of research that has implications for both the arts and computer sciences, and more generally, the learning sciences. The focus of this poster is to turn our attention to the understudied area of the arts and examine how the learning of arts and programming can open new avenues of research.

A design studio found at a community technology center in South Central Los Angeles presents an interesting opportunity to explore the ways in which youth culture are already making use of new media as tools for expression, particularly capitalizing on software that promote computer programming. The studio and its design software were created with a constructionist theory of learning in mind, which poses that people learn best when they are active participants in design activities and share their design with others (Papert, 1980). The findings outlined here build on one of the main concepts of constructionism, *appropriation*, which posits that learners construct knowledge by making it their own. Resnick (1996) points to two constructional-design principles, which allow the creator to appropriate knowledge through the making of (1) personal connections (i.e., connections to outside interests, past experiences, or prior knowledge) and (2) through epistemological connections (i.e., the ability to connect to important domains of knowledge). We add a third component to this analysis, (3) cultural connections (i.e., connections to larger cultural context). The results suggest that youth leverage previous knowledge in the design process, appropriating the design software through personal, cultural, and epistemological connections to their work.

## Methods

Over the past year, we have documented design activities that incorporate computer programming at a design studio with predominantly Latino/a and African-American youth ages 8-18 through extensive ethnographic field note taking (Creswell, 2003). Young artists created a variety media arts projects such as animated stories, Videogame art, and interactive or playable art using pop culture images and sounds. Using a comparative case study approach, the artist in this study was selected from over 30 other case study participants based on the prototypical nature of her work and her persistent interest over a period of multiple weeks in using computer programming for expression. Field notes were open and axial-coded for themes derived from the theoretical framing.

## Findings

For this analysis, we draw from an example of a “dance video” called “k2b,” created by a thirteen-year-old female software designer, who modeled the piece after a Gwen Stefani music video. When the viewer presses a start button, music begins to play, characters dance on the screen, and the background changes between several different

images. At the start of the project, the first-time designer had an existing interest in pop music and chose to use “Hollaback Girl” as the basis for her music video. As a result, she chose images and music that reflected her perception of pop culture and music videos. The use of a shared cultural context (i.e., the pop music video) resonated with other members of the design studio. During the design process, members would gather behind the designer to watch the “k2b” video, being drawn in by the music. In addition to her interpretation of the well-known music video, the designer made additional personal connections to the piece such as choosing to insert both a picture of herself and her younger brother as two of the dancers in her music video.

Undoubtedly, when designers create media art they are connecting to many different bodies of knowledge, here we focus on connections to the traditional arts and computer programming. The aesthetics of the images played an important role in the design process. In the search for “k2b” images, it was less important to her to insert an image of herself, as it was to find one that fitted her perception of how a music video should appear, underscoring the importance of understanding and emulating contemporary art and pop culture aesthetics in media art production. Additional connections to traditional arts include the designer’s attention to the choreographing the dancers. “k2b” required precise timing and unique dance moves of each of the characters. During these design moments, programming took a back seat to design considerations of when characters should enter and exit the stage and how each of the dancers should move—roles that seldom assumed by youth in the traditional arts. The designer also made connections to computer science. This is exemplified by the designer’s use of programming concepts like looping constructs, conditionals, and assembling programs out of base components — concepts that are even new for novice computer science majors. In addition, she was able to repurpose code in a meaningful way and accomplish artistic design goals for the piece by taking pieces of code and creatively recombining them for new characters.

## Discussion

This case study illuminates how programming within an arts context is very different from context of math and science. Programming in this context is less about code and more about personal expression. While case studies of work in the design studio give us only a partial understanding of the larger design culture, they do provide us with an understanding of how individuals are able to repurpose the design environment for personal expression. The advantages of this work are at least threefold: (1) Media arts have implications for broadening the participation and applications of traditional programming courses in K-12 which tended to focus on mathematics and science; (2) Media arts are an essential component to artistic expression in a digital era—a tool that has an arguably increasing importance for youth and society at large; and (3) these projects emphasize graphic, music and video — media that have been found to be at the core of technology interests for youth and thus could provide new opportunities to encourage and broaden participation of youth from under-represented groups to become designers and inventors with new technologies.

## References

- AEP (2004). *The Arts and Education: New Opportunities for Research*. Washington, DC: Arts Education Partnership (AEP).
- Creswell, J. W. (2003). *Research Design: Qualitative, Quantitative, and Mixed Methods*. Thousand Oaks, CA: Sage Publications, Inc.
- Papert, S. (1980). *Mindstorms: Children, Computers, and Powerful Ideas*. New York: Basic Books.
- Resnick, M., Bruckman, A., & Martin, F. (1996). Pianos Not Stereos: Creating Computational Construction Kits. *Interactions*, 3(6).
- Sefton-Green, J., & Buckingham, D. (1998). Digital Visions: Children's 'Creative' Uses of Multimedia Technologies. In J. Sefton-Green (Ed.), *Digital Diversions: Youth Culture in the Age of Multimedia* (pp. 62-83). London: UCL Press.

## Acknowledgments

The work reported in this poster is conducted in collaboration with Mitchel Resnick’s research group at the MIT Media Lab and supported by a grant of the National Science Foundation (NSF-0325828). The views expressed are those of the authors and do not necessarily represent the views of the supporting funding agency or the University of California, Los Angeles.