Building Interdisciplinary Bridges Across Cultures

Daniel A. Walzer & Jesse M. Heines

Abstract

This paper presents initial outcomes from the first year of a two-year project funded by the Advancing Informal STEM Learning (AISL) program of the National Science Foundation (NSF). The project is a partnership between the Bartlett Community Partnership School in Lowell, Massachusetts, and the Computer Science and Music departments at the University of Massachusetts Lowell. The authors are frequent collaborators, with mutual research interests in interdisciplinary education, computing and music-related technologies, artistic performance, and community learning. They offer varied perspectives on how an integrated Computing+Music program encourages diverse skill acquisition through supportive and nurturing environments for middle school students. Building on recent multidisciplinary research in two predecessor an NSF-funded projects, “Teaching a Computer to Sing” investigates how middle school students—aged ten to fourteen—build critical thinking and problem-solving skills through informal, yet cogent learning activities in a voluntary after-school choral program. This paper explores how deploying age-appropriate, music-centered, and technology-mediated pursuits gives middle school students a chance to explore the connections between academic fields that are normally offered as isolated, grade-specific courses in formal classrooms. It argues that pertinent, multidisciplinary instructional experiences engage middle school students at a pivotal stage in their cognitive and emotional development through the collective appeal of popular music, informal learning, sociocultural mentorship, and accessible technology.

Bio

Daniel A. Walzer - Assistant Professor of Composition and New Media, Dept. of Music, UMass Lowell - is a versatile music educator, having taught courses at a variety of institutions and implemented new interdisciplinary curricular programs. Walzer's recent publications include articles and reviews in the Journal of Music, Technology & Education, Leonardo Music Journal, and the Journal of Radio and Audio Media. Jesse M. Heines, Professor, Dept. of Computer Science, UMass Lowell - comes to CS with a background in educational media and technology. He is the co- author with Gena Greher of Computational Thinking in Sound, published by Oxford University Press in 2014. He teaches courses in object-oriented and graphical user interface programming and co- teaches Sound Thinking, an original, interdisciplinary course at the intersection of computing and music. Jesse was PI on CPATH award CNS-0722161 and TUES award DUE- 1118435. He is an avid barbershopper, singing with both a chorus and a competitive quartet.

Jesse M. Heines, Professor, Dept. of Computer Science, UMass Lowell - comes to CS with a background in educational media and technology. He is the co- author with Gena Greher of Computational Thinking in Sound, published by Oxford University Press in 2014. He teaches courses in object-oriented and graphical user interface programming and coteaches Sound Thinking, an original, interdisciplinary course at the intersection of computing and music. Jesse was PI on CPATH award CNS-0722161 and TUES award DUE- 1118435. He is an avid barbershopper, singing with both a chorus and a competitive quartet.