

Leveraging Community Cultural Wealth to Support K-8 CT Education in Kentucky Appalachia

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Abstract—Since the departure of the coal industry, Kentucky Appalachia has been striving to cultivate new ways of living in the region that is consonant with their culture and values. Developing a workforce that is competitive in the digital economy is a central part of the region's plan for revitalization, with local educators and organizations beginning to invest, with intention, in CS/ CT education for K-12 students. The panel consists of local leaders (administrators, teachers, parents, and community leaders) of K-8 CS/CT initiatives in the region. They will discuss how building a K-8 computational thinking pathway both leverages and helps to strengthen their community's cultural wealth.

Keywords—Kentucky Appalachia, computational thinking, community cultural wealth, culturally responsive rural education

I. SUMMARY

Economically and socially devastated by the mass departure of the coal industry [1], Kentucky Appalachia has been striving to cultivate new and sustainable ways of living in the region that is consonant with their culture and values. For example, the non-profit Shaping Our Appalachian Region (SOAR) unites individuals and organizations that “unequivocally believe THERE IS A FUTURE IN APPALACHIA” around core values of faith, grit, teamwork, leadership, service, compassion, purpose, strategy, accountability and creativity [2]. Three of SOAR’s seven major goals for regional revitalization are directly related to technology, including the goals of expanding broadband, developing a 21st century workforce, and expanding entrepreneurship that takes full advantage of the digital economy [3].

Eastern KY educators and organizations have focused attention towards computer science (CS) and

computational thinking (CT) education for K-16 students, partly through a National Science Foundation (NSF) funded research-practice partnership (“Tough As Nails”) to create K-8 computational thinking pathways in Pikeville Independent School District and Floyd County Schools [4]. Cultural responsiveness has been an express goal of this project, with the team continuously attending to strengthen and support local vision, goals, priorities and processes in CS/CT education, and regularly discussing what it means for Eastern KY to pave their own path in CT education [5] [6][7][8].

Community cultural wealth refers to the often underappreciated strengths and assets that marginalized communities tend to possess. Tara Yosso first described these assets in her 2005, “Whose culture has capital? A critical race theory discussion of community” [9], pointing out how communities of color and students of color tend to be culturally wealthy in part because of the hardships they have collectively experienced. Yosso explains that the wealth comes in various forms. For example, *aspirational capital* refers to the ability “to maintain hopes and dreams for the future, even in the face of real and perceived barriers,” while *familial capital* refers to cultural knowledges nurtured among *familia*, or kin, “that carries a sense of community history, memory and cultural intuition” [9]. There is also navigational, resistant, social and linguistic capital [9].

These forms of capital exist in a strong way in Kentucky Appalachia, and recent efforts in CS/CT education, including Tough As Nails, have leveraged this. For example, aspirational capital and kinship were extremely important and useful not just in forming the project, but in sustaining its momentum throughout the COVID-19 pandemic. The panel of regional leaders (representing the perspectives of administrators, teachers, parents, and community education and business organizations), will share how CS/CT education and Appalachian community cultural wealth mutually reinforce one another, and invite the audience to ponder this intersection together.

II. PANEL STRUCTURE

The participants will first explore Appalachian culture and perspectives through resources such as the *The Appalachian Retelling Project* [10]. The moderator will then introduce the panel context and panelists. The core of the panel will be a discussion at the intersection of community cultural wealth and K-12 CS/CT education in KY Appalachia. Focal discussion topics will include: *(i) How can Appalachian strengths like “kinship,” “ability to maintain hopes and dreams for the future,” “grit and ability to resist injustice” support in K-8 CS/CT education in KY Appalachia? (ii) Conversely, how might K-8 CS/CT education help to further amplify these strengths?* After a moderated panel discussion on these key questions, the audience will be invited to share how the questions relate to their work and generate new ideas on behalf of the Appalachian CS/CT community and beyond.

III. POSITION STATEMENTS

A. Emi Iwatani (Moderator)

Emi is a Senior Learning Sciences Researcher at Digital Promise and co-principle investigator for NSF *Tough As Nails*. With expertise in culturally responsive research methods, and K-12 research-practice partnerships, she hopes this panel will benefit Kentucky Appalachia as much as it does the audience, and invites the audience to share synergistic thoughts and ideas as they arise.

B. Traci Tackett

As the Director of Digital Literacy at Bit Source, LLC., Traci led efforts to support educational initiatives in Eastern KY related to CS and CT. As the

On Site Director of NSF Tough As Nails, she leads professional development initiatives to regional teachers in technology. Additionally, she is the Regional Lead for Remake Learning Days East KY and collaborates with community stakeholders to promote family engagement.

C. Neil Arnett

Neil has been serving Kentucky teachers and students in educational technology for 19 years, and trained over 1000 KY teachers in multimedia project-based learning, digital tools integration, makerspaces, and CT. He is District Technology Coordinator for Pikeville Independent Schools, President of East Region Association of Technology Coordinators, and Regional Representative of KY Society for Technology in Education. Neil’s team has been awarded local and national grants to expand CT and CS in rural Appalachia. He firmly believes that making technology an integral part of the educational process is key to leveling the playing field for Eastern KY children to compete on a global stage.

D. Kelsey Tackett

Kelsey Tackett is an 8th Grade Reading and Science teacher at South Floyd Elementary School located in Floyd County, Kentucky. Kelsey is an Educational Specialist with certifications from the University of Kentucky and Harvard Business School. She has been the recipient of several grants which have allowed her to work with students in a variety of STEM fields such as Dell Tech Certification, Girls Who Drone, and Successful Women and Appalachian Girls mentoring program.

E. Payton May

Payton is a Central Appalachian native from Pikeville, Kentucky with ethnic connections to Ireland, Spain, England, Scotland, the Indigenous Americas, and beyond. In a time of fractured identities, he takes pride in the diversity of his family. Formally trained as an architect and urban designer, Payton continues his family’s entrepreneurial legacy as a partner in several businesses including *Bit Source*, a software development company that focuses on employing displaced coal industry professionals and *Hashtag Appalachia*, a regional brand perpetuating positive Appalachian narrative. Passionate about design and sustainability, he enjoys working with students on projects such as Future Cities, ECLRP, Creative Cats, and Early Visions.

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