Co-Designing an AI Curriculum with University Researchers and Middle School Teachers

Christina Gardner-McCune
University of Florida
Gainesville, Florida, USA
gmccune@ufl.edu

David Touretzky
Carnegie Mellon University
Pittsburgh, Pennsylvania, USA
dst@cs.cmu.edu

Bryan Cox
Georgia Department of Education
Atlanta, Georgia, USA
bcox@doe.k12.ga.us

Judith Uchidiuno
Carnegie Mellon University
Pittsburgh, Pennsylvania, USA
jio@andrew.cmu.edu

Yerika Jimenez
University of Florida
Gainesville, Florida, USA
jimenyer@ufl.edu

Betia Bentley
Maxporeal, LLC
Bennett's Mill Middle School
Fayetteville, Georgia, USA
bbentley@maxporeal.com

William Hanna
Thomas County Middle School
Thomasville, Georgia, USA
whanna@tcjackets.net

Amber Jones
Tuner Middle School
Lithia Springs, Georgia, USA
amber.jones@dcssga.org

ABSTRACT

Over the past year, our AI4GA team of university faculty and middle school teachers have co-designed a middle school AI curriculum. In this poster we share how we used co-design both as a tool for collaboratively developing engaging AI activities and as a mechanism for mutual professional development. We explain our co-design process, give examples of curriculum materials provided to teachers, and showcase several teacher-created activities. We believe this approach to curriculum development centers the lived experiences of teachers and leverages the knowledge and expertise of university researchers to create high quality and engaging AI learning experiences for K-12 students.

1 METHODS

Our AI4GA team of university faculty and middle school teachers engaged in a year-long co-design process to collaboratively design a 9-week middle school AI elective [1]. Co-design is a collection of processes for engaging groups of stakeholders in collaboratively developing products and technologies [3]. In the context of this project, co-design consisted of three phases that allowed researchers and teachers to build a shared understanding of the goals of the curriculum, to learn how to interact in the co-design sessions, to build trust, to feel comfortable to speak candidly, to offer dissenting opinions, to advocate for their students, and finally to design activities that students and teachers will use in the classroom. The team met for 1 hour weekly for 33 sessions. Phase 1 - Researchers framed curriculum ideas and teachers provided feedback (10 wks), Phase 2 - Teachers adapted the curriculum resources to meet their instructional styles and student needs, and piloted the course (18 wks), and Phase 3 - Teachers framed new curriculum ideas and adaptations of materials, which researchers helped refine (5 wks).

2 OUTCOMES

Overall, the co-design process was a valuable learning tool for the entire team. Our process included bi-directional professional development and curriculum writing components. The researchers taught the teachers the basics of AI while learning from them how to actively engage middle school learners with technical content. Similarly, the researchers determined the organization of the course and the major topics covered, and the middle school teachers contributed significantly to the curriculum by designing novel activities. Through this process teachers and researchers became more aware of their power, and the interests and learning needs of the students became the common ground for making design decisions. The result was a range of high-quality AI activities that students enjoyed.

3 CONTRIBUTIONS

This poster describes a process that incrementally built the technical expertise and agency of teachers while shifting the inherent power structure that exists between researchers and teachers. However, we do not claim to have obliterated the power dynamics, this is an ongoing process [2]. This poster will highlight both our process, agency shifts, and types of artifacts produced during each phase of the co-design process.

REFERENCES

[1] AI4GA. 2022. Artificial Intelligence for Georgia. https://AI4GA.org.
[2] M. Farr. 2018. Power dynamics and collaborative mechanisms in co-production and co-design processes. *Critical Social Policy* 38 (2018), 623–644. Issue 4. https://doi.org/10.1177/0261018317747444
[3] M. Steen. 2013. Co-Design as a Process of Joint Inquiry and Imagination. *Design Issues* 29 (2013), 16–28. Issue 2. https://doi.org/10.1162/DESI_a_00207