CRAFT-work: An Integrative Co-Design Approach for Designing High School AI Literacy Resources

VICTOR R. LEE, Stanford University, USA
PARTH SARIN, Stanford University, USA
JACOB WOLF, Stanford University, USA
BENJAMIN XIE, Stanford University, USA

Drawing upon current best practices from human-computer interaction, design, and learning sciences literatures, we advocate for an integrative approach working with high school teachers to creating AI literacy resources for use in their teaching. Some distinct emphases in our AI literacy development work is a commitment to educational co-design where teachers are partners in the work, focusing on AI in and across disciplines rather than as a standalone topic, and supporting modularity of resource use.

Additional Key Words and Phrases: AI Literacy, co-design, high school, learning sciences

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1 INTRODUCTION

A longstanding slogan of high-tech entrepreneurship culture in the Silicon Valley has been to innovate by "moving fast and breaking things". This statement underlay innumerable new engagements with and about computational technology, including those that deliberately oriented toward education. However, we are dubious that approach is desirable or even practicable for lasting educational innovation. The complexities of the education system and the intensity of demands placed on educators call for more thoughtful and responsive approaches. Rather than breaking things, we favor collaboration and adaptation within K-12 education. We do maintain forward-looking innovation as a core value, but our position is that an integrative approach to bringing about innovation, as briefly summarized here, practical and desirable, especially as we seek to foster AI literacy with and through schools.

Our team and perspective is informed by current thinking from our diverse affiliations with academic communities including but not limited to learning sciences, human-computer interaction, and computer science education. We work together on a program of design and development supported by a number of entities at Stanford University including the Stanford Insitutute for Human-Centered Artificial Intelligence (HAI), the Stanford Accelerator for Learning (SAL), Stanford Digital Education, the McCoy Family Center for Ethics in Society. We identify as the "CRAFT" project - **C**lassroom-**R**eady **A**I resources **f**or **T**eachers. The name reflects our overarching aims: we are designing and developing digital resources and resource collections with high school teachers to explore and develop students' AI literacies. We see our work as resource development rather than a priori curriculum development, critically informed by teachers and their key mediational and facilitative roles in all classroom learning.

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2 OUR APPROACH

The CRAFT approach is distinct in the following ways:

- *Educational co-design.* Following current best practices in educational design research and aligning with our genuine appreciation of what practicing educators are doing every day, we have intentionally structured our work as codesign with teachers [2]. This involves early and frequent exchanges between researchers, designers, and teachers - keeping in mind those identities are not mutually exclusive - to ideate, interrogate, and improve upon ideas for instructional materials and resources for actual classroom use. Concretely, this means meeting together, identifying needs and sharing ideas, reviewing and improving prototypes, and inviting teachers to test run any resources to provide some first-person experiences. We have intentionally partnered with high school teachers both within and outside of our local geography as codesign partners to ensure that similarities and differences of the teacher experience can be better represented.
- *Multidisciplinary.* As we have written elsewhere [1], thinking about new learning opportunities and connections across the disciplines is an underutilized but important direction for future work. From conversations with teachers and years of work with schools, it is not reasonable to expect schools can add new classes on artificial intelligence nor that they would be broadly accessible to all students. An alternative approach is to provide resources that are usable for teachers in a range of disciplines to have one-off explorations with their students about how AI is impacting work in that specific discipline. For example, AI is raising questions about practices of art and writing as well as scientific and historical inquiry. Let's embrace that. Just as one strategy for computer science integration in the United States has gone under the guise of "STEM+C", we advocate for an "AI+" discipline lens so that we can leverage the powerful ideas and practices of existing disciplines while also being attuned to how AI is enabling new ways of knowing and doing in those disciplines.
- *Modularity.* We recognize that extended curricula are powerful and can bring about rich learning. At the same time, because AI is not mandated nor broadly expected content and since schools are not given the resources to easily offer new courses that are provided to students equitably, and also because teaching practice involves teachers curating and adapting elements of instruction that they individually find most pertinent for their goals and students, we are focusing on creating resources that can be bundled together but can also be acceptably used in isolation, with some guidance for how teachers can best use bits and pieces if they choose not to use whole suites of resources. This is why we orient toward resources rather than a curriculum, although we would confidently assert there is still value in producing whole curricula that extend for multiple weeks.

3 RELATION TO AI LITERACY EDUCATION COMMUNITY

A number of compelling AI literacy projects are underway outside of our work as a CRAFT team that we are following in earnest. Where we distinguish our specific effort is in the combination of commitments listed above. We have adopted these because they represent an additional way to broaden access to AI literacy, adjacent to other efforts that are in action now. As figures based out of a research institutions, we expect to not only generate resources that are usable to a broader public but also to advance our academic research and design knowledge about codesign practices around a topic where the technical state of the art is continually changing and prior background knowledge is highly variable, in updating the field's understandings of how teachers are selecting and effectively using digital resources, and expanding ideas about where AI "belongs" in in schools.

Moreover, in reference to the "move fast and break things" mentality that we mentioned above, we believe the time is now right to advance a new vision for innovation as this instantiation of the AI literacy education community coalesces.

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