

Challenges in Integrating Computer Science Into K-12 Education and How We Approach it

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Introduction

In elementary education, computing is often integrated with other subjects, but there are many barriers to doing so.

Barriers faced by primary teachers to teach CS:

1. (Internal) Knowledge Barriers
2. (internal) Attitude and Self-Efficacy Barriers
3. (external) Logistics and Environmental Barriers

Montana Story Project

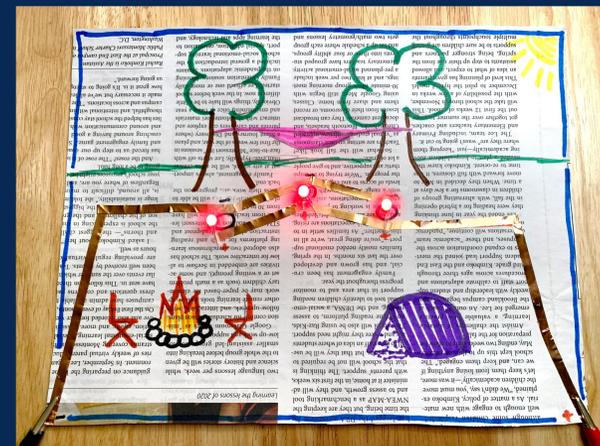
This curriculum and professional development project for grades 4-8 aims to integrate CS into Montana schools while also offering content that aligns with the **Indian Education for All Act (IEFA)**, which is mandatory for all Montana students.

Research-Practice Partnerships

Research-Practice Partnerships (RPPs) are long-term collaborations between practitioners and researchers aiming to address persistent problems of practice and improve educational outcomes.

- Education team collaborates with CS team
- Having stakeholders on board
- Privileging Indigenous ways of knowing

Project Example



Ledger Art



Running Eagle Blackfeet Warrior Woman by Terrance Guardipee

Next Steps

We will run professional development (PD) this summer to prepare teachers to implement what they have learned and experienced in PD to their classroom. Goals of PD include:

- Develop necessary skills & dispositions
- Change attitude & improve self-efficacy
- Share classroom management strategies and tips
- Make e-textiles projects

Curriculum Design: Three-Level Strategy Framework

Identify existing concepts and skills	<ul style="list-style-type: none"> • IEFA Essential Understanding • CS Content Standards • Science Standards • Language Arts Standards
Enhance the disciplinary content	think about creating artifacts involving ledger art design and story-telling through programming, crafting, and sewing.
Extend the disciplinary concept	<ol style="list-style-type: none"> 1. create a narrative relevant to personal experience 2. design ledger art artifact to convey personal narrative 3. program ledger art by applying CS concepts

