

# Project Proposal

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## Predicting Success of K-2 Literacy Intervention

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[Page Ahead Children's Literacy Program](#) is the leading provider of children's book and literacy services in Washington State, serving more than 850,000 children with 3 million new books since 1990. Based on the research that if a child can read at grade level by 3rd grade, they'll continue to read at grade level throughout their academic career, Page Ahead's literacy programs especially aid reading and language skills of at-risk children. Page Ahead's Book Up Summer program provides K-2nd grade students their choice of 12 new books, at no cost to the student, that are theirs to keep and read over each summer vacation. This program, based on literacy research in Florida<sup>1</sup> and elsewhere, has been shown to help address a well-established<sup>2</sup> phenomenon called "summer reading setback" where reading abilities decline in summers.

Data provided to Page Ahead from the state of Washington is proposed to be analyzed to assess the performance of the Book Up program in the WA elementary schools Page Ahead serves. Student assessed as "at risk" or not meeting reading standards in kindergarten receive 0 to 3 years of Book Up program intervention services. At third grade the state begins a mandatory testing program based on the Smarter Balanced Assessment Consortium<sup>3</sup> (SBAC) testing system. The target predictors is whether these students meet English Language Arts (ELA) literacy standards [level 3 or 4]. The data contains other factors that may or may not correlate with the success for meeting standards which may help families, school, and third party programs like Page Ahead to identify kids at highest risk.

The proposed product of this project is a tool that can predict the impact on the probability of meeting ELA literacy standards of Page Ahead's Book Up program for K-2 students. The projected impact will be a function of the number of summers a student receives the Book Up intervention as well as their kindergarten reading MAP score.

## MVP

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An MVP would successfully identify kindergarteners who evaluated below standards and received 3 years of the Book Up program, which may not occur at the same school, and evaluate the increase in probability for meeting 3rd grade SBAC standards. This involves evaluating each student for how many years of Page Ahead services they received, Kindergarten and 3rd grade ELA performances. A model can then be fit to simply predict the probability for  $\text{MetStandard} = Y$ . The MVP model will fit  $\text{MetStandard}$  as a function of kindergarten RIT score and number of treatments received.

# Data

Two example data files have been provided by Page Ahead:

- Seansample.xlsx
- Seandata2.xlsx

I signed an [Affidavit of Nondisclosure](#) with Page Ahead on 10/16/2019. Subsequently I was provided access to 6 files totalling ~90MB of csv files. The table below give an idea of the features based on the example data.

Variable	Type	Description	Used for Model
RITScore	Int	K-2 performance score	Target
Score	Int	SBAC performance score	Target
LevelCode	string	SBAC performance level	Target
MetStandard	string	Indicates is student met state standards	Target
CurrentEnrollment SchoolID	Int	School student is entrolled in	track
TestSchoolID	Int	School student took assessment at (indicates move)	Y
CurrentGrade	int	Grade in school student is in at time of assessment	Y
TestSchoolYear	string	School year at time of assessment	Y
TestSeason	string	Part of school year assessment was taken	Y
TestName	string	Assessment used	Y
Gender	string	gender - use for assessing at risk groups	Y
RacialEthnicGroup	string	Ethnicity - use for assesing at risk groups	Y
ELLStatus	string	English Language Learner - use for risk groups	Y
PrimaryLanguage	string	Mother tongue - use for risk groups	Y
HomeLanguage	string	Language spoken in home - risk groups	Y
LivingWith	string	Household leader - use for risk groups	y

## Known Unknowns:

- Total number of students served by Page Ahead that we can track: Low income student tend to be pretty mobile. Moving to a different school that isn't served by Page Ahead will reduce the number of students receiving the intervention. The data above will be combined with data from Page Ahead indicating which schools they serve and when they began serving those schools.
- The performance of Book Up interventions, while almost certainly helpful, may not be enough to overcome other factors. So, the percentage of kindergartners at risk that ultimately meet standards in 3rd grade may not have been previously assessed.

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1. Allington, Richard L and Anne McGill-Franzen, **Addressing Summer Reading Setback Among Economically Disadvantaged Elementary Students**, Reading Psychology, 31: 411-427, 2010. [↗](#)

2. Alexander, Entwisle, & Olson, 2007; Allington & McGill-Franzen, 2003; Cooper, Nye, Charlton, Lindsay, & Greathouse, 1996; Entwisle, Alexander, & Olson, 1997. See ref 1, pg. 412. [↗](#)

3. Smarter Balanced Score Reporting, <http://www.smarterbalanced.org/assessments/scores/>. [↗](#)