REDESIGNING MONTANA’S EDUCATION SYSTEM FOR A CHANGING GLOBAL ECONOMY
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Why Do We Have the System We Have?

The current education system has its roots in the turn of the century – The 20th Century!

- Prepared workers for a burgeoning assembly line factory model
- Assimilated immigrants into American culture
- Provided widespread basic literacy and numeracy
- Critical thinking necessary for only a select percentage
- Leveraged lessons from across Europe
How Has the Current System Performed?

Actually, quite well…for a long period of time

- 🧑‍🎓 For almost a century, the U.S. led the world in education attainment and quality
- 📈 Drove the biggest economy in the history of the world to ever new heights
- 👨‍👩‍👧‍👦 Fostered an explosion of the middle class
- 🏛️ Backbone of a stable democracy
- 🏢 Production engine that helped win 2 world wars
80’s, 90’s and 00’s: Global Economic Change

So what happened?

Low wage competition
- Low skill
- High skill
- All skill levels

Automation of jobs involving routine work

Vast extinction of low-skill, routine work jobs in high-wage countries
Attainment: The Last 70+ Years

Percentage of persons 25 through 29 years old, by highest level of educational attainment: Selected years 1940-2016

- High school completion or higher
- Bachelor's or higher degree
- Less than high school completion
What We Spent, What We Got for It

Per Pupil Spending and NAEP 12 Grade Math Scores, 1978 to 2012

*Revised assessment format
What We Spent; What We Got For It

*Revised assessment format
## Income Distribution: The Last Half Century

### Mean (Average) Household Income by Quintile and Top 5%

<table>
<thead>
<tr>
<th>Household Segment</th>
<th>2017 Mean Income</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bottom Quintile</td>
<td>$13,258</td>
</tr>
<tr>
<td>4th Quintile</td>
<td>$35,401</td>
</tr>
<tr>
<td>Middle Quintile</td>
<td>$61,564</td>
</tr>
<tr>
<td>2nd Quintile</td>
<td>$99,030</td>
</tr>
<tr>
<td>Top Quintile</td>
<td>$221,846</td>
</tr>
<tr>
<td>Top 5%</td>
<td>$385,289</td>
</tr>
</tbody>
</table>

Source: US Census Bureau, 2018
Spending Per Student

Per Pupil Expenditure by Country, 2015
Primary and Secondary Education, All Services

Source: OECD Education at a Glance, 2018
2013, Frey and Osborne conclude that 47% of U.S. jobs could be automated with existing equipment.

2017, McKinsey and Co. conclude that ~50% of global work activities can be automated with currently available equipment.

Demand for high-wage [high-skill] occupations will grow, while demand for middle-wage [middle-skill] occupations will decline.
40 years ago, there were plenty of jobs in high-wage countries for high school graduates who were reasonably literate in language and mathematics.

Today, there are plenty of people in low-wage countries who are just as literate and plenty of machines that can do the work requiring that level of basic literacy that will do the work for much less.

New jobs will be created, but most of those jobs will require not just retraining, but a much higher and deeper level of education as well as targeted technical training.

Nations that fail to educate their students to levels of education previously enjoyed only by their elites will face increasing income inequality and decreasing political stability.

The forces at work are moving with increasing speed.
To What Extent is this True in Montana?

From Montana Department of Labor and Industry: “Increasing consumer demand coupled with a shortage of available workers led to more job openings remaining unfilled, even after businesses made 27,000 hires during August.”
Montana’s Aging Population

Population > 65 has been growing, but the population < 65 has been relatively flat since 2000.

Proportion of children expected to shrink as the state population is expected to grow around 1% per year.

20% of Montana’s workforce will retire in the next 10 years.
Can Montanan’s Fill the Jobs
OF A FLOURISHING, HIGH-TECH INDUSTRY?

- Defined by BBER as “firms that make or sell high tech products, provide professional services or consulting related to high tech, conduct e-commerce, or engage in manufacturing using skilled labor”

- These jobs pay 59% more than average state earnings and raise wages 0.8% faster than the state average

- Forecast employment and revenue gains 7x higher than statewide growth rates

- In 2019, high-tech firms grew 9x faster than other sectors, generating $2.5 billion in revenues (an all-time high)

- But as skill needs become more sophisticated, will Montanan’s be able to continue to do the jobs needed?
But it’s about much more than economics …

1. Morality and ethics
2. Ability to deal as citizens with a wide range of highly complex existential issues
3. Much fuller development of those qualities that make us fully human
4. Ability to interact with a broad range of people all over the globe
5. Capacity and desire to preserve and defend freedom and democracy
Deep understanding of the core concepts underlying the disciplines—the big ideas

Ability to apply those concepts and ideas to wide range of practical problems

Full range of intrapersonal and interpersonal skills

The moral and ethical grounding needed to make wise decisions

So…What Do Young People Need to Compete in an A.I. World?
Potential Solutions - How the US Responded

REFORM AGENDA SINCE 1970’S

- More money (more than doubled over a period of 20 years)
- Lower class size
- School competition (charters and vouchers)
- Technology
- Tough test-based teacher-accountability systems
Our Competitors Had a Different Analysis

Rather than modeling their education system on a factory model, they modeled it on a professional working environment.

They started with the end in mind.

They analyzed their context and the global context.

They designed their entire education system as an engineer would to get the results they wanted.
Our Competitors Had a Different Analysis

- Did not double down on the old model (inexpensive teachers; low standards); that model is designed to produce majority of graduates with little more than an 8th grade level of literacy.
- Knew the jobs available to them would rapidly decline.
- Needed to provide a world-class education to every single student - equitably and efficiently.
- All of that required a whole new model.
Their Model vs. Ours

THE 2018 PISA RESULTS

• In reading…
  • 8 systems outscored the U.S.
  • 11 systems were statistically tied with the U.S.
  • 57 systems scored worse than the U.S.

• In mathematics…
  • 30 systems outscored the U.S.
  • 8 systems were statistically tied with the U.S.
  • 39 systems scored worse than the U.S.

• In science…
  • 11 systems outscored the U.S.
  • 11 systems were statistically tied with the U.S.
  • 55 systems scored worse than the U.S.
In mathematics performance, average 15-year-old US students are more than a year behind students from the top-performing countries. Students in Hong Kong and Singapore are between 2.5 and 3 full years ahead of average US students in math while Chinese students are nearly four full years ahead of US students.

Montana ranks just slightly above national average on NAEP, so how does this suggest Montana would compare at a global level?